SKILLS · FOR · FLIGHT

Air Law

ternational Air Law – UK Air Law – Operational Procedures

1

OXFORD AVIATION TRAINING

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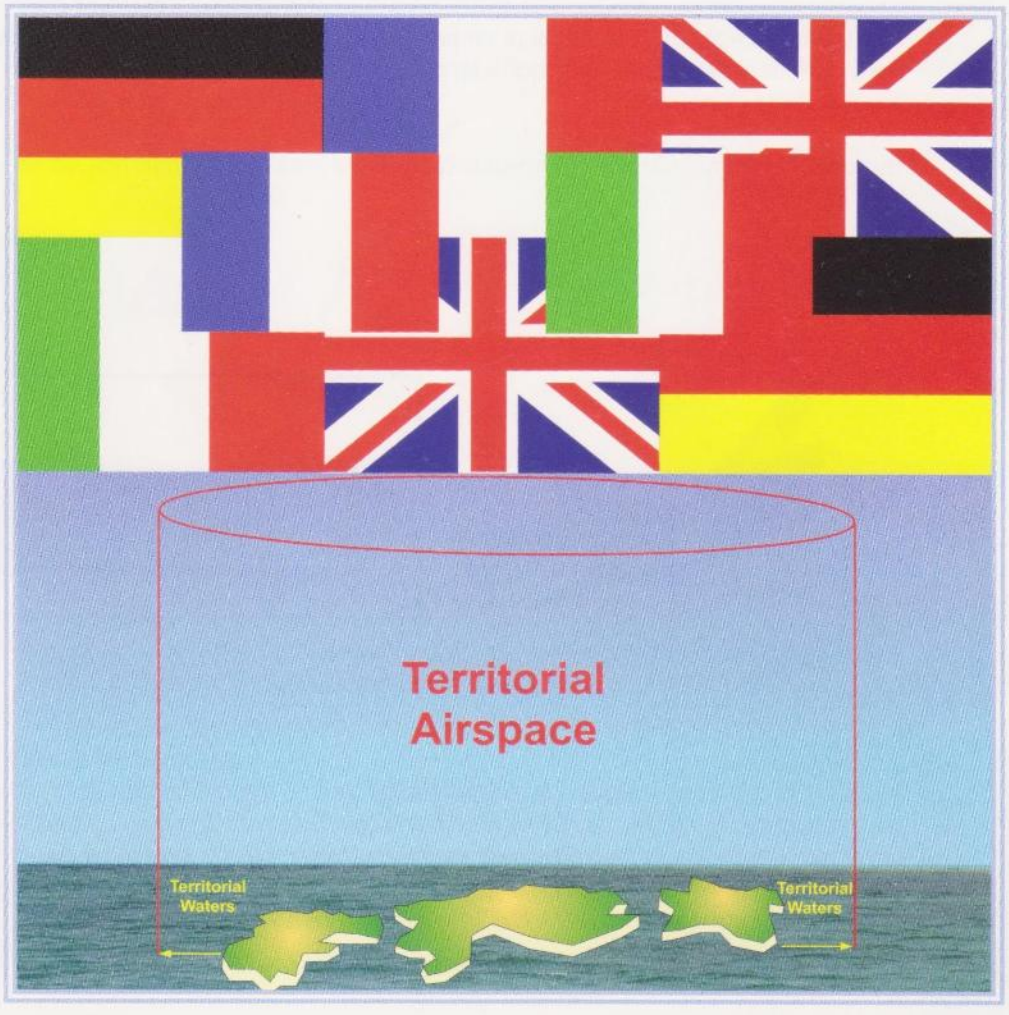
GENERAL

AIR LAW

CHAPTER 1
INTERNATIONAL AIR LAW



THE CONVENTION ON INTERNATIONAL CIVIL AVIATION - HISTORICAL BACKGROUND.

The first scheduled international air service began in 1919 which coincided with the first international conference on civil aviation in Paris.

The Second World War saw huge advancements in aviation which forced nations to realise that without a cohesive and international effort to create supra-national laws, further advancement would not be possible.

Consequently, invitations were sent to 55 allied states to meet in Chicago in November 1944.

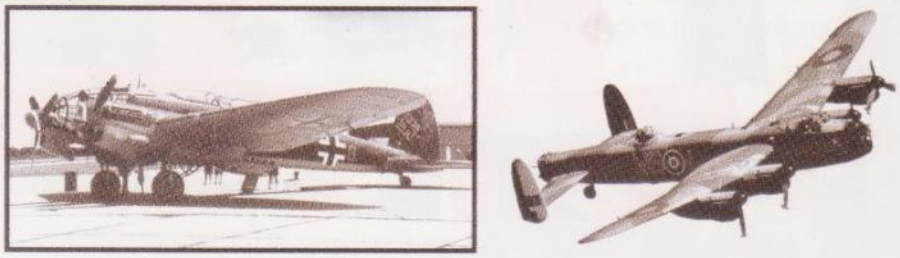


Figure 1.1 World War II.

The Meeting in Chicago.

The outcome of this meeting was the The Convention on International Civil Aviation (often referred to as the **Chicago Convention**) in which a number of principles – or **Articles** - were agreed. It soon became clear that a permanent international body was needed to oversee, implement and administer these Articles. This was achieved in 1947 with the formation of **The International Civil Aviation Organisation (ICAO)** based in Montreal, Canada.

The Convention on International Civil Aviation (The Chicago Convention) created ICAO as a permanent international body to oversee, implement and administer the Articles (Standards and Recommended Practices).

Figure 1.2 ICAO Headquaters, Montreal.

The following articles and definitions of the Convention on International Civil Aviation must be known by a PPL candidate:

Article 1 – Sovereignty.

States that: *"All Contracting States recognise that every State has complete and exclusive sovereignty over the airspace above its territory".*

Every contracting state has complete and exclusive sovereignty above its territory.

Sovereignty implies the right of a State to impose national law on users of the State's territorial airspace.

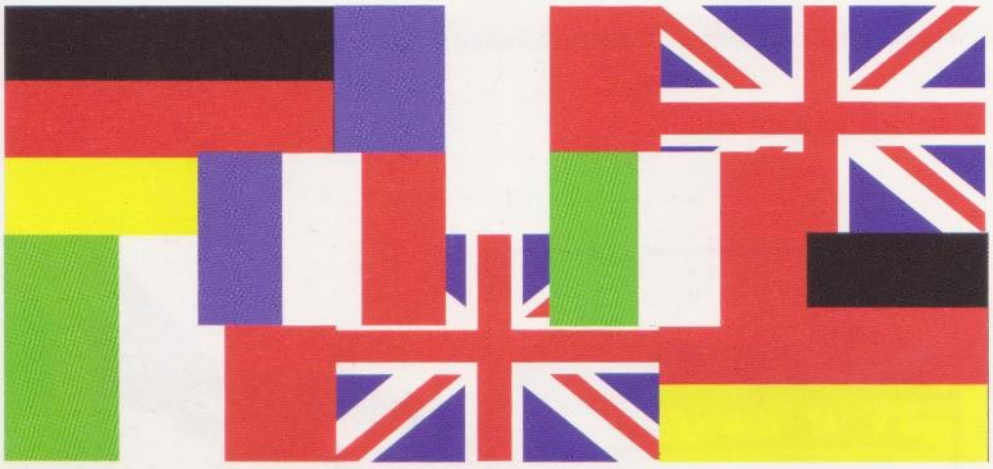


Figure 1.3 Flags of Sovereign Nations.

Article 2 – Definition of "Territory".

Defines "territory" as: *"the land areas and territorial waters adjacent thereto under the sovereignty, suzerainty, protection or mandate of a State".*

The Territory of a State consists of the land areas and its adjacent territorial waters.

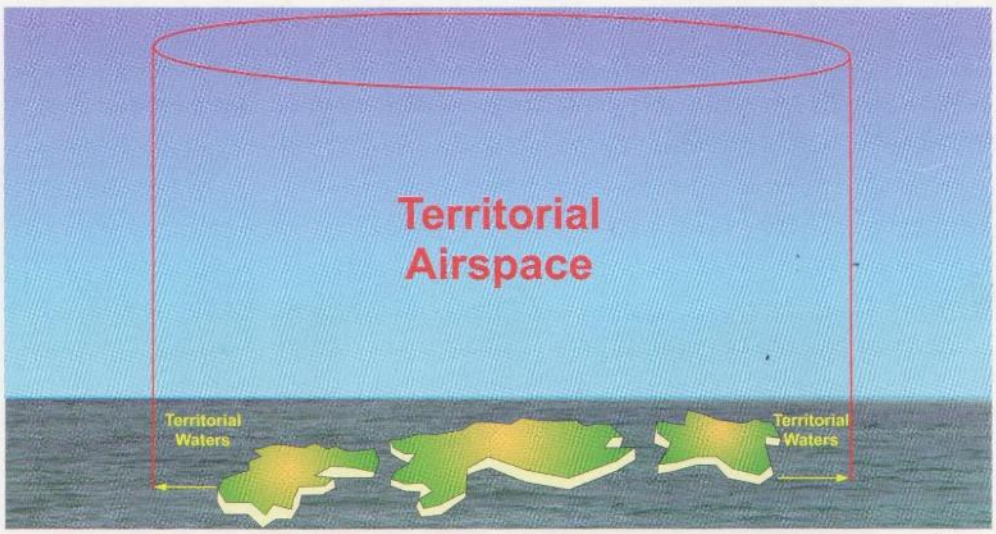


Figure 1.4 Territorial Airspace.

Article 5 – Rights of Non-Scheduled Flights.

3 points are covered by this article with regards to non-scheduled flights:

- Each State must allow non-scheduled flights into or through its territory and to land without prior permission.
- Any State has the right to require an over-flying aircraft to land.

Note: Scheduled flights require permission to overfly another State.

- Each State has the right to require an aircraft which is flying over inaccessible terrain, or in airspace which is inadequately served by navigational aids, to follow prescribed routes or to obtain special permission to conduct such flights.

Only non-scheduled flights are allowed to fly into or through the airspace of another Contracting State without permission.

Article 10 – Landing at Customs Airports.

This article concerns itself with the right of any State to require an aircraft entering its territory to land at a customs airport and to be subject to examination (unless that aircraft has obtained permission to over-fly).

Furthermore, a State has the right to require an aircraft departing its territory to take-off from a designated customs airport.

Figure 1.5 Customs.

Article 11 – Applicability of Air Regulations.

Regardless of its nationality, any aircraft operating within a State's territory must obey the rules and regulations of that State.

Article 12 – Rules of the Air.

This article covers 4 major points:

- All aircraft must obey the Rules of the Air of the State in which it is flying.

Note: It is the responsibility of the State which regulates the airspace in which the aircraft is operating to ensure that this rule is complied with.

It is the responsibility of the State which regulates the airspace in which an aircraft is flying to ensure its rules and regulations are complied with.

- All States must endeavour to keep their Rules of the Air as close as possible to that of the Convention (ICAO).
- Over the high seas the Convention's (ICAO) Rules of the Air shall apply without exception.
- Each Contracting State undertakes to prosecute all persons violating these regulations. Before entering another State's airspace with the intention of landing, the pilot must ensure that:

Before entering another State's airspace with the intention of landing, the pilot must ensure that:

1. *The aircraft is correctly registered.*
2. *The aircraft is airworthy.*
3. *All relevant documentation, including the C of A, is on board.*

- The aircraft is correctly registered.
- The aircraft is airworthy.
- All relevant documentation, including the Certificate of Airworthiness (C of A), is on board.

Figure 1.6 Rules of the Air.

Article 13 – Entry and Clearance Regulations.

A State's laws and regulations must be obeyed with regards to the entry and departure of any passengers, crew or cargo.

All aircraft entering or departing from a State are required to adhere to the laws and regulations of that State.

These would include laws and regulations concerning:

- Entry.
- Clearance.
- Immigration.
- Passports.
- Customs.
- Quarantine.

Article 16 – Search of Aircraft.

Each State has the right to search, without reasonable delay, the aircraft of other Contracting States on landing and departure. It also has the right to inspect certificates and any other document specified by the Convention.

Article 22 – Facilitation of Formalities.

All Contracting States undertake to adopt measures to expedite the navigation of aircraft between States and to prevent unnecessary delays to aircraft, crews, passengers and cargo, especially in the areas of:

- Immigration.
- Quarantine.
- Customs.
- Clearance.

Figure 1.7 Customs.

Article 23 – Customs and Immigration Procedures.

Each Contracting State shall establish customs and immigration procedures in accordance with the Convention. This does not, however, prevent any State establishing customs-free airports.

Article 24 – Customs Duties.

Aircraft arriving, departing or crossing the territory of another State will be admitted temporarily free of duty.

Fuel, oil, spare parts and aircraft stores plus any regular equipment that is on board an aircraft on arrival shall be exempt from customs duty, inspection fees or similar charges *as long as they remain on board*.

This privilege does not apply to anything that is taken off the aircraft. However, any spare parts that are imported for use by another aircraft from another State will be free of duty.

Article 29 – Documents Carried in Aircraft.

According to the Chicago Convention all International flights of Contracting States must carry the following original documents:

- Certificate of Registration (C of R).
- Certificate of Airworthiness (C of A).
- Crew licences.
- Radio Station Licence – if equipped with a radio.
- Journey log book.
- A list of any passengers together with their names, places of embarkation and destination.
- If applicable, the Cargo Manifest and a detailed declaration of the cargo.

All aircraft on an international navigation flight are required by the Chicago Convention to carry, amongst other documents the C of R, C of A and crew licences.

Note: JAA (JAR-OPS 1.125) require a slightly different list of original documents which is as follows:

- Certificate of Registration (C of R).
- Certificate of Airworthiness (C of A).
- Crew licences.
- Radio Station Licence – if equipped with a radio.
- Third party liability insurance certificate.
- Noise certificate (if applicable).

The radio licence is issued by the state of registration.

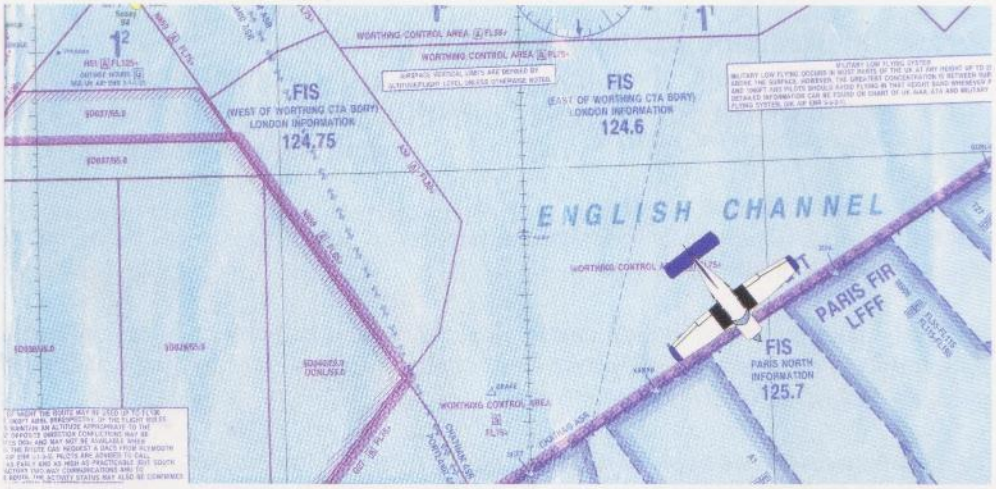


Figure 1.8 All Aircraft must carry the above documents at all times.

Article 30 – Use of Aircraft Radio Equipment.

The State of Registry is that State or country in which the aircraft is currently registered and in whose register details of the aircraft and ownership are entered.

- Aircraft operating in another State's territory must carry a licence to install and operate radios issued by the state of aircraft registration.
- The use of such radios will be in accordance with the rules and regulations of that State in which the aircraft is being operated.
- Radios may only be operated by crew holding appropriate licences issued by the State of Registration.

Figure 1.9 Radios may only be operated by personnel with the appropriate licences.

Article 31 – Certificate of Airworthiness.

Every aircraft engaged in international navigation must be provided with a Certificate of Airworthiness issued by the State of aircraft Registration.

Flying licences are issued by the State of Registration.

UNITED KINGDOM
CIVIL AVIATION AUTHORITY

CIVIL AVIATION AUTHORITY

Certificate No: 034612/005

CERTIFICATE OF AIRWORTHINESS

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-BSFK	PIPER AIRCRAFT CORPORATION PIPER PA-28-161	28-8516062

TRANSPORT CATEGORY (PASSENGER) — Date of Expiry: 10 July 2005

This Certificate of Airworthiness is issued pursuant to the Convention on International Civil Aviation dated 7 December 1944, and to the Civil Aviation Act 1982, and the Orders and Regulations made thereunder, in respect of the above-mentioned aircraft which is considered to be airworthy when maintained and operated in accordance with the foregoing and the pertinent operating limitations. The CAA Approved Flight Manual forms part of this Certificate.

Date of Validity: 11 July 2002

for the Civil Aviation Authority

Note: Following replacement, this Certificate of Airworthiness will cease to be in force and should be returned to the address below.

No entries or endorsements may be made on this Certificate except by an authorised person. If this Certificate is lost, the Civil Aviation Authority should be informed at once. Any person finding this Certificate should forward it immediately to the Civil Aviation Authority, Safety Regulation Group, Aviation House, South Area, Gatwick Airport, West Sussex, RH6 0YR.

Figure 1.10 Certificate of Airworthiness.

Article 32 – Licences of Personnel.

Pilots and other operating crew must be provided with licences and certificates of competency issued by the State of aircraft Registration.

However, States reserve the right to refuse to recognise such licences or certificates issued to its nationals by other States for flights over its territory.

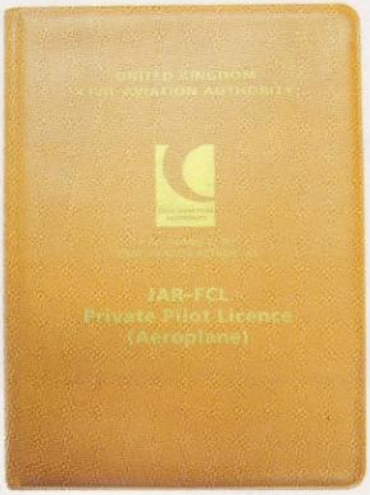


Figure 1.11 JAR FCL Private Pilot's Licence.

C of A's and licences issued by one State shall be recognised by another State providing they meet the standards laid down by the Convention.

Article 33 – Recognition of Certificates and Licences.

Certificates of Airworthiness and competency together with licences issued by the State of Aircraft Registration shall be recognised by other Contracting States provided they meet the standards laid down by the Convention. In other words that they meet ICAO standards.

Figure 1.12 Pilot's Licences.

Article 34 – Journey Log Books.

All aircraft engaged in international navigation shall maintain a Journey Log Book which is to contain particulars of:

- the aircraft,
- the crew and
- each journey

in the form laid down by the Convention.

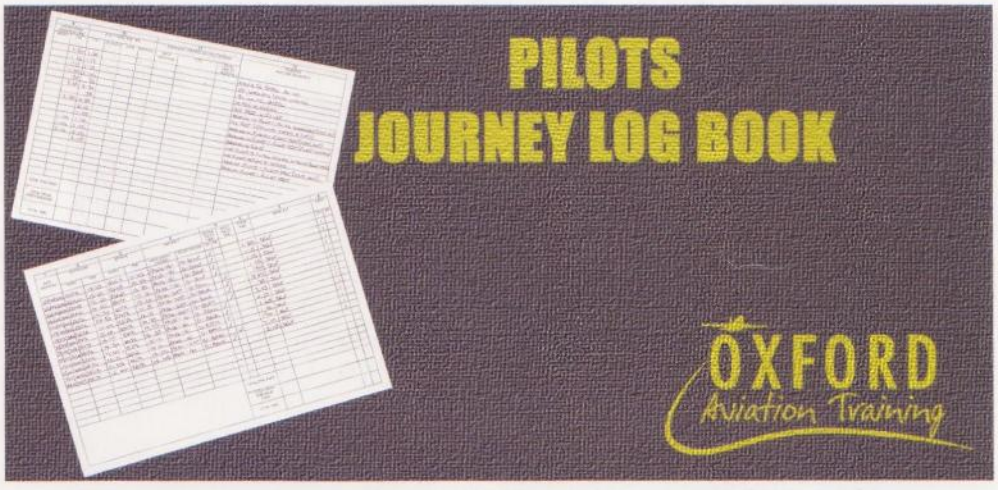


Figure 1.13 Journey Log book.

Article 35 – Cargo Restrictions.

No munitions or implements of war may be carried in or above the territory of a State without the permission of that State.

Each State is to define what constitutes munitions and implements of war in line with the recommendations of the Convention.

All States reserve the right to prohibit the carriage of any other article as long as this prohibition does not jeopardise the safety of the aircraft or its passengers.

Figure 1.14 Cargo.

No munitions of war may be carried in or above the territory of a State without permission of that State.

Article 36 – Photographic Apparatus.

Each Contracting State may prohibit or regulate the use of photographic apparatus in aircraft over its territory.

Figure 1.15 Photography.

Article 37 – Adoption of International Standards and Procedures.

All States are to undertake to collaborate in order to ensure that there is uniformity of:

- Regulations.
- Standards.
- Procedures.
- Organisation of aircraft and personnel.

To this end ICAO is to adopt and amend Standards and Recommended Practices, (SARPS) as may be necessary dealing with:

- Communication systems, and air navigation aids including ground markings.
- Airports and landing area.
- Rules of the Air and ATC practices.
- Licensing of operating crew and maintenance personnel.
- Airworthiness of aircraft.
- Registration and identification of aircraft.
- Collection and exchange of meteorological information.
- Log books.
- Aeronautical maps and charts.
- Customs and immigration procedures.
- Aircraft in distress and accident investigation.

Eighteen Annexes to the Chicago Convention have been established covering the SARPS mentioned above. These Annexes are listed on Page 15.

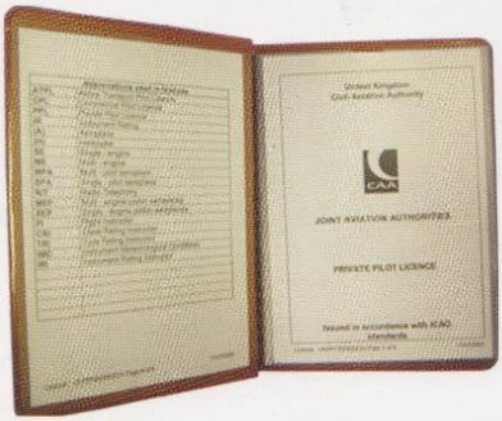


Figure 1.16 JAR - FCL Private Pilot's Licence.

Article 39 – Endorsement of Certificates and Licences.

Any aircraft (or part of an aircraft) which fails to satisfy the standards of airworthiness shall show on its airworthiness certificate complete details of such failure(s). Such an aircraft may enter another state, with permission, but cannot depart unless such failures are rectified.

Any licence holder who does not satisfy the international standards relating to such a licence shall have full details, shown on the licence, of the particulars in which he does not satisfy the conditions.

Article 40 – Validity of Endorsed Certificates and Licences.

No aircraft or person shall participate in international navigation unless licensed to do so - except if permission is granted by the State whose territory is entered.

The use of any aircraft, or certified aircraft part in a State, other than the one in which it was first registered, is permitted only at the discretion of the state into which the aircraft or part is imported.

Figure 1.17 Essential Licences and Certificates.

ORGANISATIONS.

International Civil Aviation Organisation (ICAO).

Created by the Chicago Convention, ICAO is an inter-governmental organisation. The headquarters of ICAO are in Montreal and it provides the machinery to achieve standardisation and agreement between Contracting States in all technical, economic and legal aspects of international civil aviation.

Figure 1.18 ICAO Logo.

States have the authority to replace the rules and regulations with national laws but they must publish full details in their national Aeronautical Information Publication (AIP).

Joint Aviation Authorities (JAA).

The JAA represents the civil aviation regulatory authorities of a number of European States which have agreed to co-operate in developing and implementing common safety regulatory standards and procedures.

Figure 1.19 JAA Logo.

JAA membership is based on signing the "JAA Arrangements" which were agreed at the Convention of Cyprus in 1990.

European Aviation Safety Agency (EASA).

Based in Cologne, EASA will gradually take over the functions of the JAA. EASA will develop common safety and environmental rules at the European Level.

At the time of writing, EASA has legal responsibilities for Certification and Maintenance regulations only. It is expected that the Operational and Licensing functions will transfer from JAA to EASA during 2006/7.

Figure 1.20 EASA Logo.

MAJOR DOCUMENTATION.

ICAO Annexes.

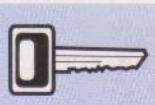
The rules and regulations (Standards and Recommended Practices) emanating from ICAO are organised into 18 Annexes.

All Contracting States have the option to replace any of these rules or regulations with their own national laws applicable to aircraft within or above their territories. If this is the case, States must publish full details in their national Aeronautical Information Publication (AIP).

The most important ICAO Annexes are as follows:

Annex 1	Personnel Licensing
Annex 2	Rules of the Air
Annex 3	Meteorological Services for International Air Navigation
Annex 4	Aeronautical Charts
Annex 5	Units of Measurement to be used in Air and Ground Operations
Annex 6	Operation of Aircraft
Annex 7	Aircraft Nationality and Registration Marks
Annex 8	Airworthiness of Aircraft
Annex 9	Facilitation
Annex 10	Aeronautical Telecommunications
Annex 11	Air Traffic Services
Annex 12	Search and Rescue
Annex 13	Aircraft Accident Investigations
Annex 14	Aerodromes
Annex 15	Aeronautical Information Services
Annex 17	Security – Safeguarding International Civil Aviation against Acts of Unlawful Interference
Annex 18	Transport of Dangerous Goods by Air

Questions may be asked on the numbering and titles of all Annexes.



The United Kingdom Air Navigation Order (ANO).

This document, enacted by Parliament, is the legal basis of United Kingdom (U.K.) civil aviation. Pilots who contravene its Articles are liable to prosecution. It also concerns itself with the Rules of the Air Regulations.

All U.K. registered aircraft are subject to the provisions of the ANO and the Rules of the Air Regulations at any time wherever they may be.

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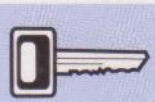
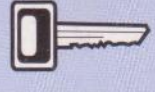


U.K. Aeronautical Information Publication (AIP).

This publication, known by many as the "Air Pilot", is the core document laying out essential information regarding all aspects of flying in the United Kingdom. It is subdivided into 3 parts:

- General Information (GEN).
- En-Route Data (ENR).
- Aerodrome Data (AD).

The AIP consists of 3 parts: GEN, ENR and AD.



Representative PPL - type questions to test your theoretical knowledge of UK and International Legislation.

1. An aircraft entering another contracting state's airspace and proposing to land must:

   a. Conform to the C of A of the airspace of the state into which it is flying
   b. Be registered, airworthy and carry all the relative documents required including the C of A
   c. Carry the C of A and the International Interception Table of Signals
   d. Ensure it carries an original copy of the flight plan only

2. Does each state have the right to search, without reasonable delay, the aircraft of other contracting states on landing and departure?

   a. Yes
   b. No
   c. Yes but this applies only to commercial aircraft
   d. Yes but this applies only to non-commercial aircraft

3. When an ICAO aircraft lands in another contracting state what items are temporarily exempt from customs duty?

   a. Aircraft spare parts and items of flight safety
   b. Only the fuel and oils remaining on board the aircraft
   c. Fuel, oil, spare parts and aircraft stores plus any regular equipment that is on board the aircraft
   d. Un-bonded goods under the strict supervision of customs

4. You are flying a UK registered aircraft over Germany. Whose Rules of the Air must you obey?

   a. ICAO's
   b. UK's
   c. JAA's
   d. Germany's

5. When can an ICAO aircraft make flights into the airspace of another contracting state without permission?

   a. If it is a non-scheduled flight
   b. If it is a scheduled flight
   c. Never
   d. If it is not carrying passengers

6. When entering into another country's airspace, the licence of the Pilot-in-Command must have been issued by the authority of:

   a. The state of aircraft registration
   b. Any JAA member state
   c. The State of Airworthiness
   d. Any contracting ICAO state

7. Which rules of the air govern the entry and departure of international air traffic into and out of a foreign state?

   a. ICAO's
   b. The foreign state's
   c. International Rules and Regulations
   d. IATA's

8. A state must recognise as valid the C of A of another member state if the C of A:

   a. Was issued in accordance with ICAO requirements and standards
   b. Was issued in accordance with international requirements and standards
   c. Is valid and current
   d. Was issued in accordance with the State of Registry

9. The C of R must be:

   a. Carried in the aircraft at all times and may be a copy of the original
   b. Carried in the aircraft at all times and must be in the original form issued
   c. Signed by the Pilot-in-Command
   d. Held in safe-keeping at the aerodrome of departure

10. All contracting states recognise that every state has complete and exclusive sovereignty over the airspace above its territory. Is this statement true?

    a. Yes
    b. No

11. Who has the responsibility to ensure that all aircraft entering a state's airspace obey that state's rules and regulations?

    a. The state of aircraft registration
    b. The state issuing the C of A of the aircraft
    c. The state which regulates the airspace in which the aircraft is operating
    d. ICAO

12. An aircraft which has failed its C of A but nevertheless has written details of the reasons why it had so failed shall:

    a. Not take part in international navigation
    b. Be allowed to depart another contracting state's airspace but cannot enter it
    c. Be allowed to enter another contracting state's airspace but cannot depart until all the failures are rectified
    d. Not take part in international navigation except with the permission of the state, or states whose territory is entered

13. All UK registered aircraft are subject to the provisions of the ANO and the Rules of the Air Regulations:

    a. Only when inside UK territorial airspace
    b. Only when within the airspace of any ICAO contracting State
    c. Anywhere at any time
    d. Only if they carry a C of A issued by the UK CAA

14. What is the name of the Convention which is commonly known as "The Chicago Convention?"

    a. The Convention of Civil Commercial Aviation
    b. The Convention on International Civil Aviation
    c. The ICAO Convention of Civil Aviation
    d. The Convention on International Civil Transportation

15. According to the Chicago Convention which of the following documents, amongst others, are required to be carried in the aircraft on an international flight?

    a. Certificate of Airworthiness (C of A), Certificate of Registration (C of R) and crew passports
    b. Crew licences and log books, journey log book and, if applicable, Radio Station Licence
    c. Crew licences, journey log book and, if applicable, the cargo manifest and a detailed declaration of the cargo
    d. Passports for all crew and passengers, Certificate of Airworthiness (C of A), Certificate of Registration (C of R)

16. The U.K. Aeronautical Information Publication (AIP) is subdivided into the following sections:

    a. GEN, AGA, ENR and AD
    b. AGA, ENR and AD
    c. GEN, AGA and ENR
    d. GEN, ENR and AD

17. Can a state search a visiting aircraft from another contracting state without permission?

a. No
b. Yes
c. Only if a crime is reasonably suspected
d. Only if it is reasonably suspected that the aircraft is carrying inadmissible passengers

18. What does ICAO Annex 2 concern itself with?

a. Personnel Licensing
b. Facilitation
c. Rules of the Air
d. Aerodromes

19. What ICAO Annex covers the Airworthiness of Aircraft?

a. Annex 8
b. Annex 9
c. Annex 12
d. Annex 14

20. What organisation will take over the responsibilities and role of the JAA?

a. IATA
b. ECAC
c. EU
d. EASA

21. The Chicago Convention recognises that:

a. Every State has sovereignty over airspace above its territory up to FL660
b. Every Contracting State has complete and exclusive sovereignty over the airspace above its territory
c. Every Contracting State has complete but not exclusive sovereignty over the airspace above its territory
d. Every Contracting State has complete and exclusive sovereignty over the airspace above its territorial waters

22. Under the Chicago Convention, the Territory of a State consists of:

a. Its total land area
b. Its total land areas and up to 10 miles of its surrounding territorial waters (if any)
c. The land areas and its adjacent territorial waters
d. Its total land areas and up to 25 miles of its surrounding territorial waters (if any)

23. All aircraft entering or departing from a State must obey the laws and regulations of:

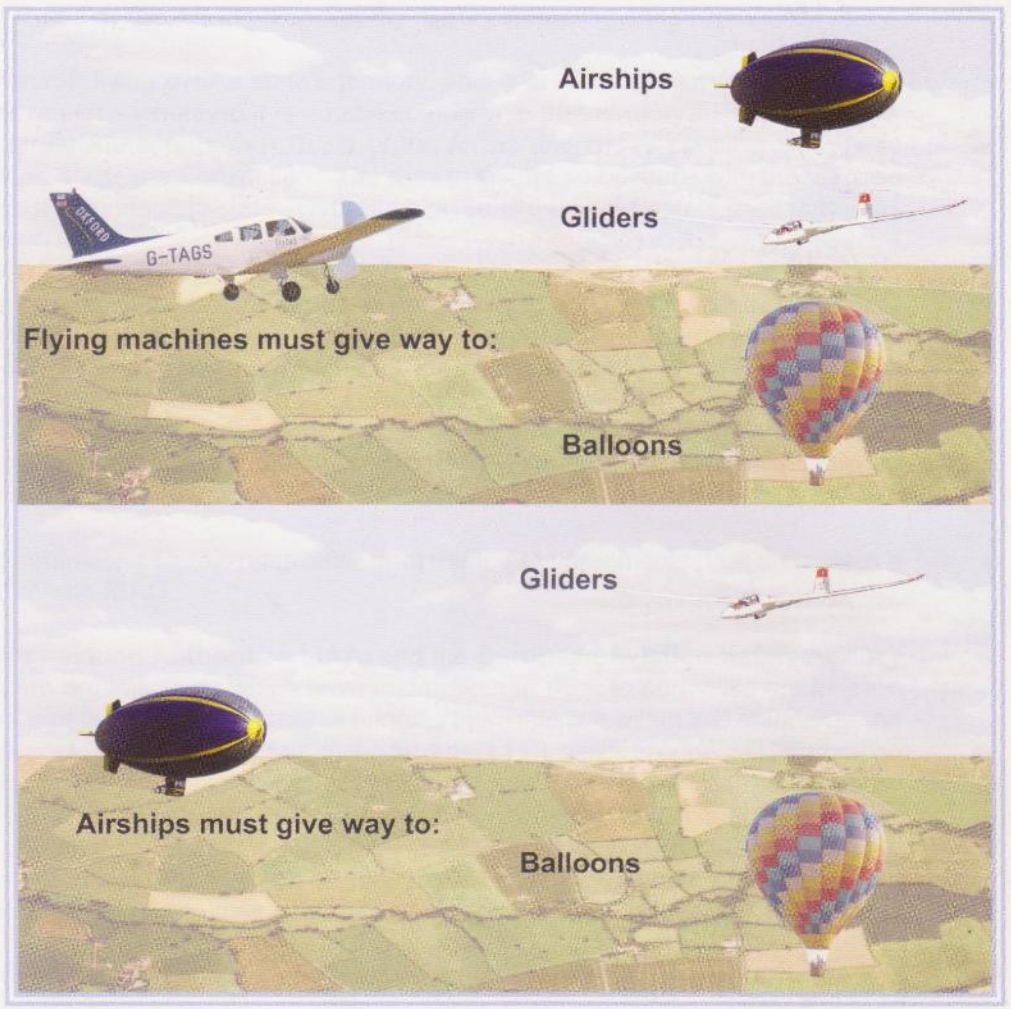
a. The State of Registry of the aircraft
b. ICAO
c. The State in question
d. The State having jurisdiction over the Customs Laws

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer												

Question	13	14	15	16	17	18	19	20	21	22	23
Answer											

The answers to these questions can be found at the end of this book.

CHAPTER 2
RULES OF THE AIR (ICAO)



RULES OF THE AIR - (ICAO ANNEX 2).

INTRODUCTION.

Article 12 of the **'Convention on International Civil Aviation'**, which addresses the issue of **Rules of the Air** to be applied by ICAO contracting states, stipulates that:

"Every aircraft flying over a state's territory, and every aircraft carrying a territory's nationality mark – wherever it is – must comply with that territory's Rules of the Air. Each state shall keep its own Rules of the Air as uniform as possible with those established under the Convention. The duty to ensure compliance with these Rules rests with the contracting state. Over the high seas the Rules established under the Convention apply."

You may expect, then, that the **Rules of the Air** which apply in any contracting ICAO state will, in general, follow the internationally agreed ICAO standards for **Rules of the Air**, as laid down in **Annex 2** of the **'Convention on International Civil Aviation'**, known commonly as **ICAO Annex 2**. However, you must also note that each ICAO contracting state, while **undertaking** to endeavour to apply the ICAO-agreed rules, may interpret the ICAO agreements in the context of its own particular requirements.

When a contracting state's rules differ from the ICAO agreements, that state "files a difference" with ICAO.

The **Joint Aviation Authorities (JAA)** and the **European Aviation Safety Agency (EASA)** are organisations which have undertaken to seek to normalise the aviation regulations of their member states by bringing them into line with ICAO standards. As this book is a text book for pilots studying for a JAR-FCL pilot's licence, the information on **Rules of the Air** contained in this chapter deals exclusively with internationally agreed ICAO standards. For the most part, the information in this chapter will apply in all ICAO member states and in all JAA/EASA member states, but it is important that student pilots refer to their own country's aviation legislation to confirm which information is relevant to their country, and to identify where differences may exist.

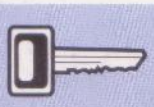
Furthermore, before flying over the territory of a state, **other than his home state**, it is the responsibility of the pilot to familiarise himself with any of that state's **Rules of the Air** which are different from those with which he has been used to complying.

The **United Kingdom (UK)** has filed several differences with ICAO in respect of the **Rules of the Air**. Those differences are covered in **Chapter 10**. **UK-based pilots and student pilots should note, therefore, that the information contained in this present chapter, covering the ICAO Annex 2 Rules of the Air, will be relevant to a UK-based pilot's needs, except in those cases where differences are noted in Chapter 10. There are some important differences in the UK Rules of the Air, so Chapter 10 should be studied carefully by UK-based pilots**. For instance, in the Rule on collision avoidance between two aircraft on a converging track, the ICAO Rule requires that the aircraft having priority should maintain heading and speed while the UK Rule requires that the priority aircraft maintains course and speed. Therefore, these rules are covered separately in **Chapters 2 and 10**. On the other hand, the ICAO Rules on aircraft lighting, and avoiding collision in the air by reference to aircraft lights, is the same in the ICAO Rules and the UK Rules. Consequently, these rules are covered in **Chapter 2**, only.

It should, of course, be a reasonable assumption to expect that all questions asked of a candidate in the **theoretical knowledge examination** in **Air Law** will be relevant to the country in which the examination is set. Nevertheless, in the **theoretical knowledge examination** on **Air Law** for the **JAR-FCL PPL**, questions often apply to **ICAO Rules of the Air**, unless the wording of the question specifically refers that question to a national Rule. So before sitting the **theoretical knowledge examination**, be sure to seek guidance from your instructor, or your **national aviation authority**, as to the latest policy on this matter.

As far as the United Kingdom is concerned, the UK Civil Aviation Authority's current policy on this matter (February 2007) is as expressed in the preface to this book. That is: in the current UK Civil Aviation Authority JAR-FCL PPL theoretical knowledge examinations for Air Law & Operational Procedures, the Air Law questions are, for the most part, based on ICAO Air Law. But where UK Air Law differs from ICAO Air Law, these questions are annotated with 'UK Law' at the beginning of the relevant questions.

APPLICABILITY OF RULES OF THE AIR.



Where there is confliction, national rules have precedence over ICAO rules. ICAO Rules apply without exception over the high seas.

The ICAO Rules of the Air apply to aircraft bearing the nationality and registration marks of a Contracting State, wherever they may be, to the extent that they do not conflict with the rules published by the State having jurisdiction over the territory overflown.

Over the High Seas (outside any territorial airspace) the ICAO Rules apply without exception.

Figure 2.1 Cessna over oil rig.

Departure from the Rules.

The Pilot-In-Command may depart from these rules in circumstances that render such departure absolutely necessary in the interests of safety. These Rules are the General Rules and, in addition to the general rules, the Pilot-in-Command (PIC), when in flight, is subject to:

Visual Flight Rules (VFR)

and

Instrument Flight Rules (IFR).

GENERAL RULES.

Protection of Persons & Property.

An aircraft shall not be operated in a negligent or reckless manner so as to endanger life or property.

Minimum Heights.

Except for taking off and landing, or when authorised, no aircraft may be flown over congested areas (cities, towns or settlements) unless at a height which permits, in the event of an emergency, a landing to be made without hazard to persons or property on the ground.

Cruising Levels.

The cruising levels at which a flight, or a portion of a flight, is to be conducted shall be defined in terms of:

- flight levels, for flights above the Transition Altitude (TA)

and

- altitudes, for flights at or below the Transition Altitude.

The cruising levels at which a flight, or a portion of a flight is to be conducted sha be defined in terms of:

a) flight levels, for flights ab the Transition Altitude (TA)

and

b) altitudes, for flights at or below the Transition Altitud

Dropping and Spraying.

Nothing must be dropped or sprayed from an aircraft except when using a method approved by the Authority, and when cleared to do so by Air Traffic Services (ATS).

Towing.

No aircraft or other object must be towed by an aircraft, except in accordance with requirements prescribed by the appropriate Authority, and when cleared to do so by Air Traffic Services (ATS).

Note: The combination of a flying machine** and the glider it is towing is to be considered as a single aircraft under the command of the Pilot-In-Command of the tug aircraft.

***A 'flying machine' is any power-driven, heavier than air aircraft.*

Figure 2.2 Glider Towing.

Parachute Descents and Aerobatic Flights.

Neither parachute descents nor aerobatic flights are to be made except under conditions prescribed by the appropriate Authority and when cleared to do so by Air Traffic Services (ATS).

Formation Flying.

Aircraft must not be flown in formation except by prearrangement among the Pilots-In-Command of the aircraft taking part in the flight.

Figure 2.3 Formation Flying.

Separation between aircraft in a formation is the responsibility of the Flight Leader and the Pilots-In-Command.

The following conditions apply:

- The formation operates as a single aircraft with regard to navigation and position reporting.
- Separation between aircraft in the formation shall be the responsibility of the Flight Leader and the pilots-in-command.
- A minimum distance of **1 km (0.5 nms) laterally and 100 feet vertically** must be maintained by each aircraft from the Flight Leader.

Prohibited Areas and Restricted Areas.

Aircraft must not be flown in a Prohibited Area or in a Restricted Area except in accordance with the restrictions or with the permission of the State over which territory the areas are established.

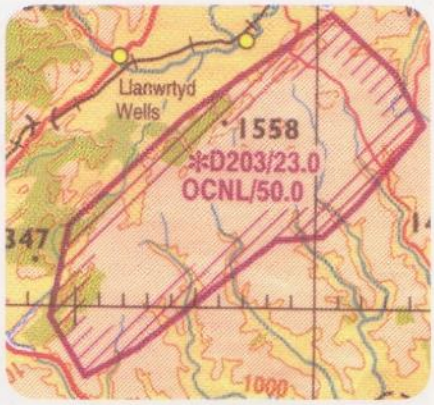


Figure 2.4 Danger Area.

Operation on and in the Vicinity of an Aerodrome.

The standard traffic pattern is to the left.

An aircraft operated on or in the vicinity of an aerodrome must, whether or not within an aerodrome traffic zone (ATZ):

- Observe other aerodrome traffic for the purpose of avoiding collision.
- Conform with or avoid the pattern of traffic formed by other aircraft in operation.
- Make all turns to the **LEFT**, when approaching for a landing and after taking off, unless otherwise instructed.
- Land and take off into the wind unless safety, the runway configuration, or air traffic considerations determine that a different direction is preferable.

Signals.
Ground-to-air visual signals are covered in Annex A to this volume.

Time.
Co-ordinated Universal Time (UTC) must be used in a 24 hour format.

A time check must be obtained by pilots prior to operating a controlled flight and, additionally, whenever necessary.

Position Reports by Aircraft Under Air Traffic Control.
Unless exempted by ATC (when ATC uses the phase **"omit Position Reports"**), a controlled flight must report to the appropriate ATSU, as soon as possible, the time and level of passing each reporting point, together with any other required information.

A Position Report should normally contain the following information:

a. Aircraft identification **
b. Position **
c. Time **
d. Flight level or altitude
e. Next position and time over that position
f. Ensuing significant (reporting) point

** **Mandatory information**

Example:

"London Control, G-ABCD, Honiley 1031, Flight Level 75, Daventry 1054, Olney next."

In the absence of designated reporting points, position reports must be made at intervals prescribed by ATC. This is normally 30 minutes after take-off and, thereafter, every hour.

AVOIDANCE OF COLLISIONS.

Line of Constant Bearing (LCB).
If two aircraft are converging on a constant relative bearing, they will collide unless avoiding action is taken. Therefore, if a closing aircraft remains in the same relative position in your field of view, a collision risk exists.

However, if the aircraft that you are observing appears to move across your windscreen, vertically or horizontally, then no collision risk exists while both aircraft maintain their tracks.

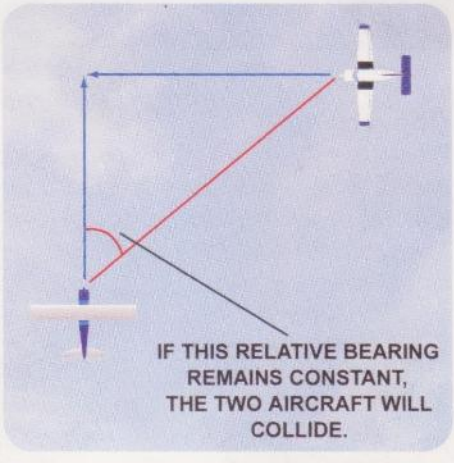


Figure 2.5 Line of Constant Bearing.

REMEMBER!

If another aircraft remains in the same relative position in your field of view, the aircraft will collide, so take early avoiding action!

Proximity.

An aircraft must not be operated in such proximity to other aircraft as to create a danger of collision.

Figure 2.6 An aircraft shall not be operated in such proximity to other aircraft as to create a danger of collision.

RIGHT-OF-WAY – AIRCRAFT IN THE AIR.

If two aircraft are approaching head-on, both must turn right to avoid collision.

Approaching Head-On.

When two aircraft are approaching head-on, or approximately so, and there is danger of collision, each must alter its heading to the right **regardless of the type of either aircraft**.

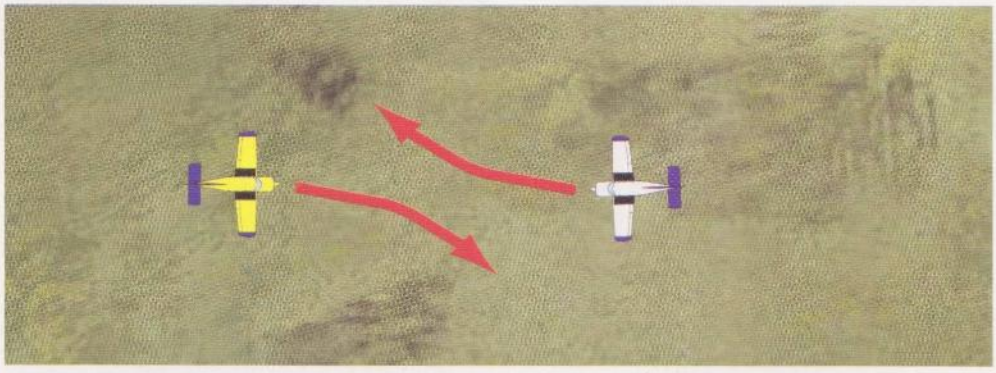


Figure 2.7 Approaching head-on - both aircraft turn right.

When two aircraft are converging, the aircraft that has right of way shall maintain its heading and speed.

Converging.

When two aircraft are converging at approximately the same level, the aircraft that has the other on its right must give way. The aircraft having priority must maintain its heading and speed.

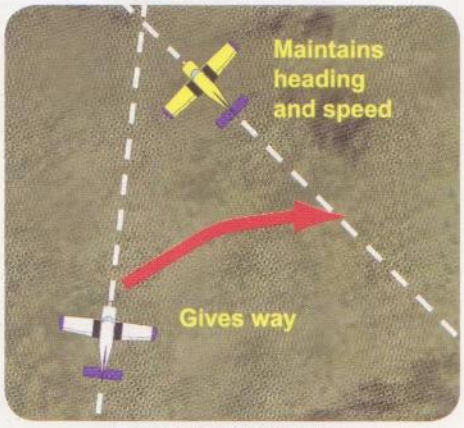


Figure 2.8 Converging.

EXCEPT as follows:

- Power-driven, heavier-than-air aircraft (i.e. flying machines) must give way to airships, gliders and balloons.

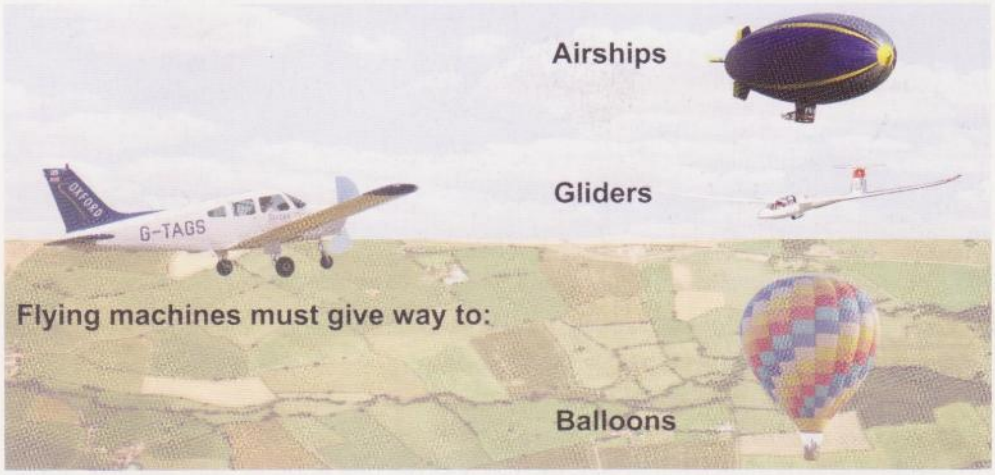


Figure 2.9a A power-driven heavier-than-air aircraft must give way to airships, gliders and balloons.

- Airships must give way to gliders and balloons.

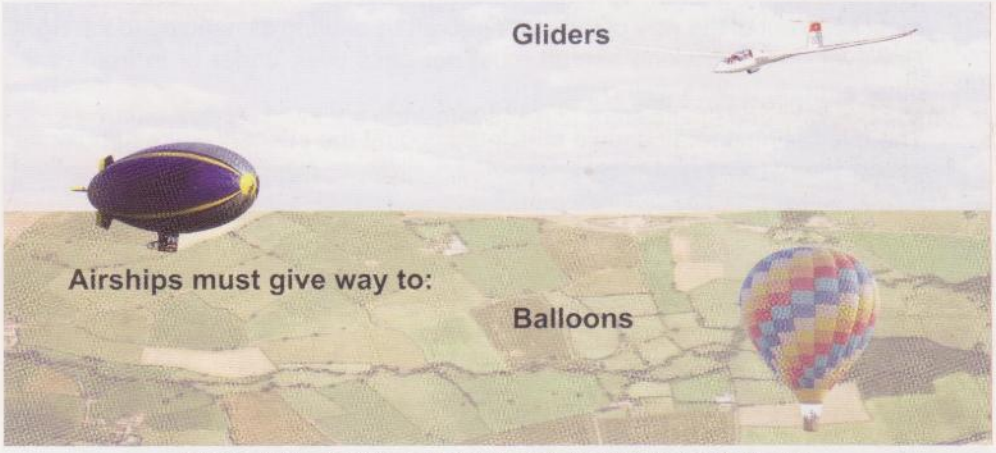


Figure 2.9b Airships must give way to gliders and balloons.

- Gliders must give way to balloons.

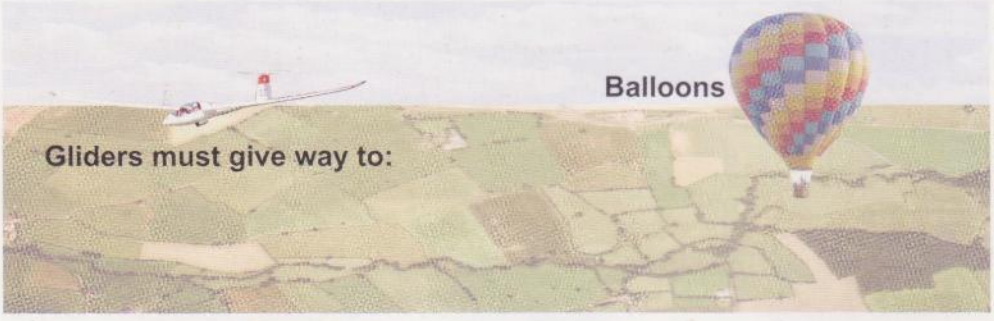


Figure 2.9c Gliders must give way to balloons.

- Power-driven aircraft must give way to aircraft which are seen to be towing other aircraft or objects.

The term "flying machine" refers to any heavier-than-air, power-driven aircraft.

The following table summarises the rules concerning right-of-way in the air.

Flying machines	give way to:	**A**irships **G**liders **B**alloons
Flying machines **A**irships	give way to:	**G**liders **B**alloons
Flying machines **A**irships **G**liders	give way to:	**B**alloons

NB: You should note that the term "flying machine" refers to any heavier-than-air, power-driven aircraft.

An aircraft is considered to be overtaking another when the faster aircraft is converging within 70° of the extended longitudinal axis of the slower aircraft.

Memorising the mneumonic **FAGB** may help you remember the right-of-way rules.

Overtaking in the Air.

An overtaking aircraft is a faster aircraft that approaches another from the rear, within a 70° arc either side of the tail.

- An aircraft that is being overtaken has the right-of-way.
- The overtaking aircraft, whether climbing, descending or in horizontal flight, must keep out of the way of the other aircraft by altering its heading to the **right**. However, the overtaking aircraft must not pass over, under or in front of the other aircraft, unless well clear.
- The overtaking aircraft should take into account the effect of wake turbulence.

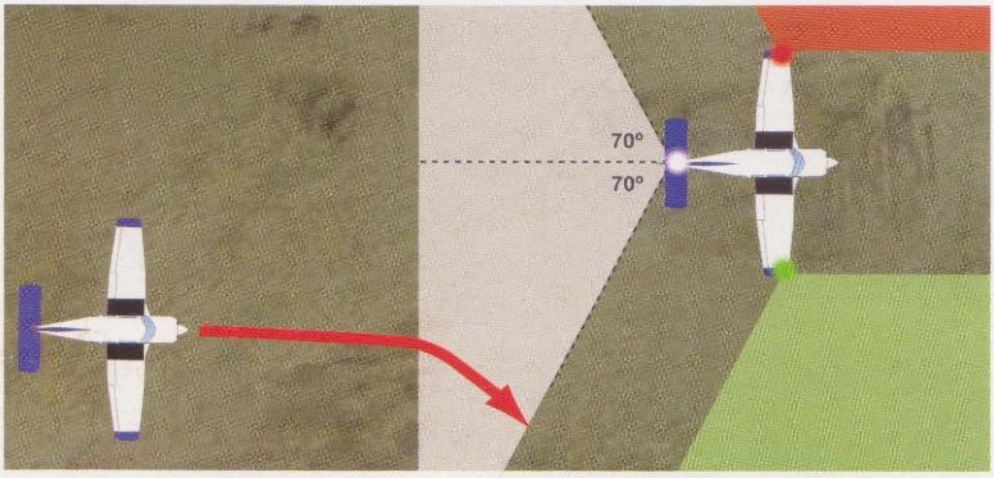


Figure 2.10 Overtaking.

Landing.

If two aircraft are on an approach to land, the higher aircraft must give way to the aircraft at a lower level.

An aircraft in flight, or operating on the ground or water, must give way to aircraft landing or in the final stages of an approach to land.

When two or more heavier-than-air aircraft are approaching an aerodrome for the purpose of landing, **aircraft at the higher level must give way to aircraft at the lower level**, but the latter must not take advantage of this rule to cut in front of another aircraft which is in the final stages of an approach to land, or to overtake that aircraft.

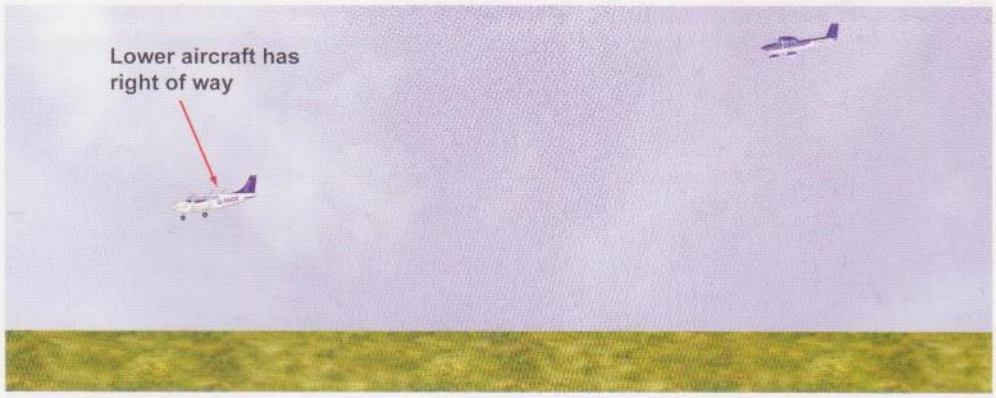


Figure 2.11 Right of Way on Landing. The lower aircraft has right of way.

Note: Nevertheless, power-driven heavier-than-air aircraft must give way to gliders.

Emergency Landing.

An aircraft that is aware that another aircraft is compelled to land must give way to that aircraft.

Taking Off.

An aircraft taxiing on the manoeuvring area of an aerodrome must give way to aircraft taking off or about to take off.

General.

- An aircraft that has the right-of-way must maintain its heading and speed.
- Nothing shall relieve the Pilot-In-Command from the responsibility of taking action to avoid collision. Therefore, even if a pilot has the right of way, he is still responsible for ensuring that he avoids the other aircraft.
- An aircraft which is obliged to keep out of the way of another aircraft must avoid passing over, under or in front of the priority aircraft, unless it passes well clear.

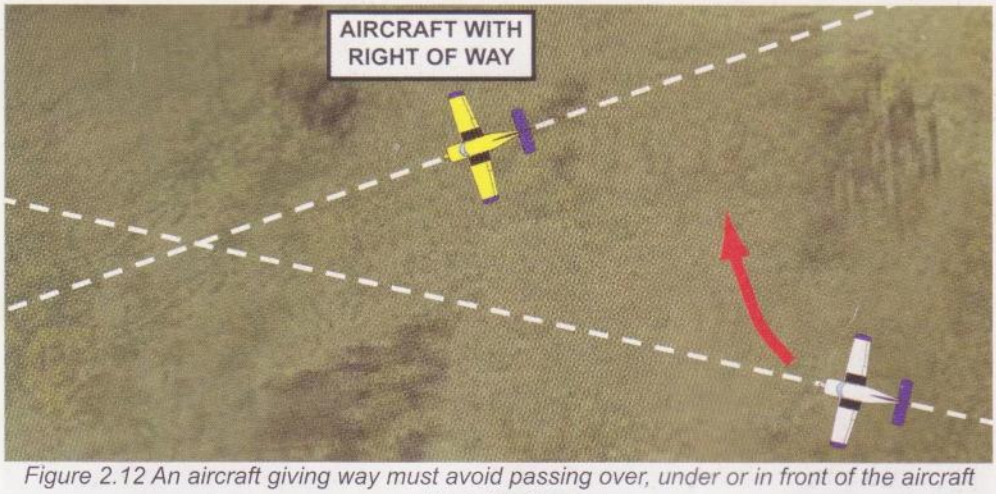


Figure 2.12 An aircraft giving way must avoid passing over, under or in front of the aircraft with right of way.

RIGHT OF WAY ON THE GROUND.

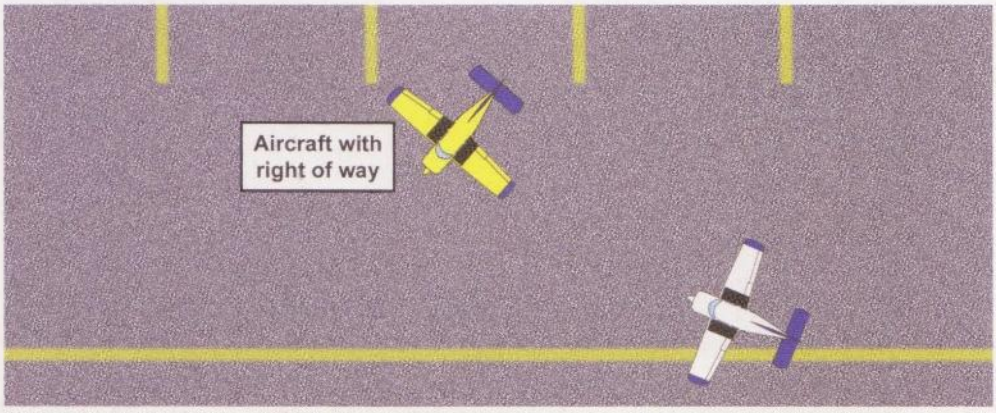


Figure 2.13 When two aircraft are on a converging course, the one which has the other on its right shall give way.

Surface Movement of Aircraft.

In case of danger of collision between two aircraft taxiing on the movement area of an aerodrome the following rules shall apply:

- When two aircraft are approaching head on, or approximately so, each shall stop or, where practicable, alter its course to the **right** so as to keep well clear of the other aircraft.

- When two aircraft are on a converging course, **the one which has the other on its right shall give way** *(see Figure 2.13)*.

- An aircraft which is being overtaken by another aircraft shall have the right-of-way and the overtaking aircraft shall keep well clear of the other aircraft. (**NB**: ICAO rules infer that the overtaking aircraft can pass on either side).

Vehicles and Aircraft.

The following are the rules concerning the rights of way of aircraft and vehicles on the movement area of an aerodrome:

- Flying machines and vehicles shall give way to aircraft which are taking off or landing.

- Vehicles and taxiing flying machines shall give way to vehicles towing aircraft.

- Vehicles which are not towing aircraft shall give way to aircraft.

Figure 2.14 A tug towing an aircraft.

- **In any case, an emergency vehicle going to the assistance of an aircraft in distress shall have priority over all other surface movement traffic.**

An emergency vehicle going to the assistance of an aircraft has priority over all other surface movement traffic.

LIGHTS TO BE DISPLAYED BY AEROPLANES.

In Flight.

From sunset to sunrise or during any period which may be prescribed by the appropriate authority all aeroplanes in flight must display:

- navigation lights intended to indicate the relative path of the aeroplane to an observer. Other lights are not to be displayed if they are likely to be mistaken for these lights.

- anti-collision lights intended to make an aircraft's presence conspicuous.

Anti-collision lights must be displayed during daylight unless they adversely affect the performance of duties or cause a harmful dazzle to an outside observer.

Navigation Lights.

There are three navigation lights fitted to aeroplanes, one on each wing tip, and the other on the aft parts of the fin. A red light is displayed on the port wing tip, a green light on the starboard wing tip and a white light at the rear of the aircraft.

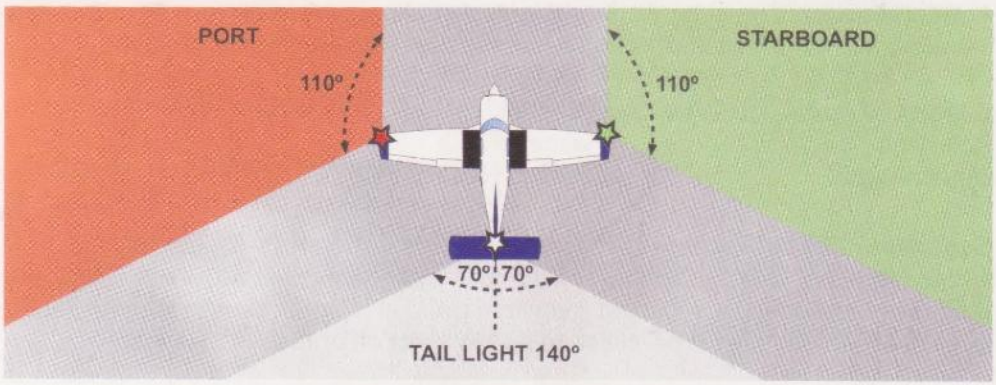


Figure 2.15 Navigation Lights (Top).

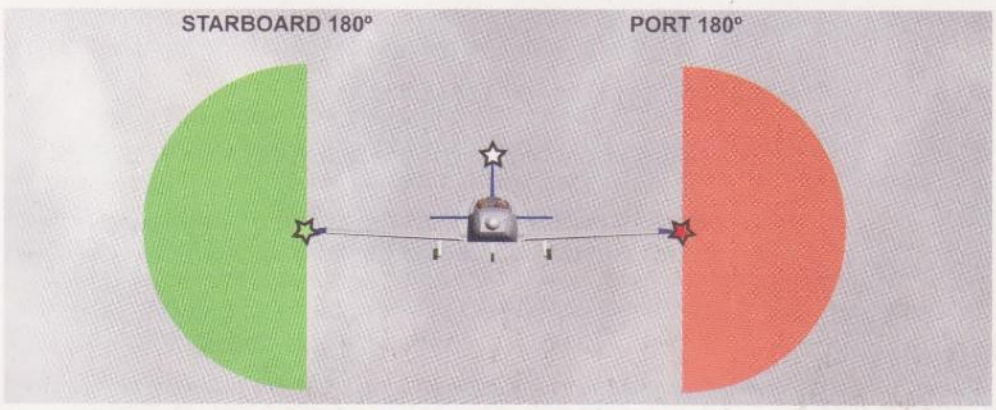


Figure 2.16 Aircraft coming towards you.

The red and green lights are required to be seen from straight ahead through 110° in the horizontal plane and through 90° above and below the aeroplane in the vertical plane. The white light must be able to be seen 70° to the right and left in the horizontal plane aft of the aeroplane and throughout 90° in the vertical plane *(see Figure 2.15)*.

Aeroplanes on the Movement Area.

From sunset to sunrise, or during any other period prescribed by the authority an aeroplane on the movement area, and an aircraft with its engines running, must display:

- When moving, navigation lights intended to indicate the relative path of the aeroplane to an observer. No other lights shall be displayed if they may be mistaken for the navigation lights.
- When moving, lights intended to indicate the extremities of its structure.
- Lights intended to attract attention to the aeroplane (anti-collision lights).
- Lights which indicate the fact that the engine is running (anti-collision lights).

Anti-collision lights must be displayed in daylight hours unless they adversely affect the performance of duties or cause a harmful dazzle to an outside observer.

Colour of Anti-Collision Lights.

Rotorcraft	-	Flashing **RED**
Other Aircraft	-	Flashing **RED** or **WHITE**

Switching Off or Reducing Flashing Lights for Safety Reasons.

In the interest of safety, if flashing lights fitted to an aeroplane adversely affect any performance of duty (i.e. reflected flash from cloud at night) or causes harmful dazzle to an observer, the pilot is permitted to switch lights off or reduce their intensity.

Lights must be switched on:

a. **In flight at night**.

b. **In flight by day** (anti-collision lights).

c. When **taxiing or parked on the Manoeuvring Area at night.**

d. When **aircraft are stationary on the apron or Maintenance Area with engines running if fitted by day and by night (anti-collision lights).**

Gliders.

Gliders at night must either display standard lights or a steady red light visible from all directions.

Free Balloons.

Free balloons at night must display a steady, red, omni-directional light suspended below the basket.

Airships.

An airship must show standard navigation lights but in addition must display an anti-collision light and a white nose light showing through 110° from straight ahead *(see Figure 2.17)*.

Failure of Navigation and Anti-Collision Lights.

On the ground, if an aircraft suffers a failed light that is required to be displayed at night and which is not immediately repairable, the aircraft must not fly.

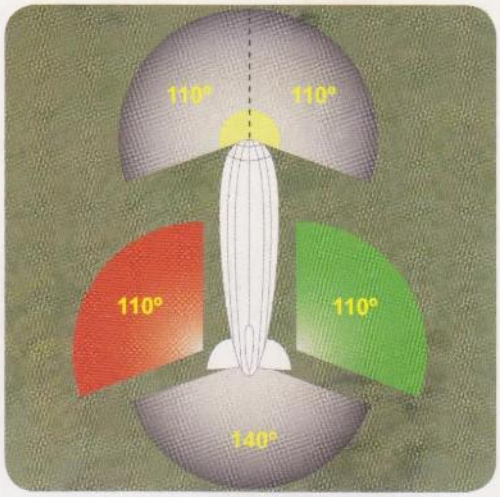


Figure 2.17 Airship Navigation Lights.

If any light fails at night, when airborne, the aeroplane should be landed as soon as is safely possible. The pilot may continue the flight only if authorised to do so by an ATC Unit.

If an anti-collision light fails during the day, the aeroplane may continue its flight providing the light is repaired at the first opportunity.

Collision Avoidance at Night.

A collision risk between aircraft is present if:

a. aircraft are operating at or near the same altitude.

b. the aircraft are converging and the relative bearing between aircraft is constant.

When the commander of an aircraft observes a light (or lights) of another aircraft at the same altitude, he must decide whether or not a collision risk exists. If there is no risk of collision, no change of heading or speed is needed.

If a collision risk exists, the pilot must first decide which aircraft has right of way in accordance to the Rules of the Air and then take what avoiding action is necessary. A pilot must not insist on his priority if to do so would cause a risk of collision.

Collision Risk & Right of Way.

If a collision risk exists and a pilot has right of way, there is no requirement for the pilot to change heading or speed, **but he must watch the other aircraft very closely to ensure that it takes avoiding action.**

Remember: A pilot must not fly under or over another aircraft or cross ahead of it unless well clear. Speed or altitude should not be changed unless such action is necessary to avoid immediate danger.

There are a number of simple rules for the pilot to observe, and a number of rhymes which may help him remember the rules:

- If you see a **RED** light on your **RIGHT** and it remains on a constant relative bearing to you, take avoiding action!

  "If to starboard **red** appear, it is your duty to keep clear".

  "**Red** on the right, gives you a fright".

  "**Green** to **red**, you could end up dead".

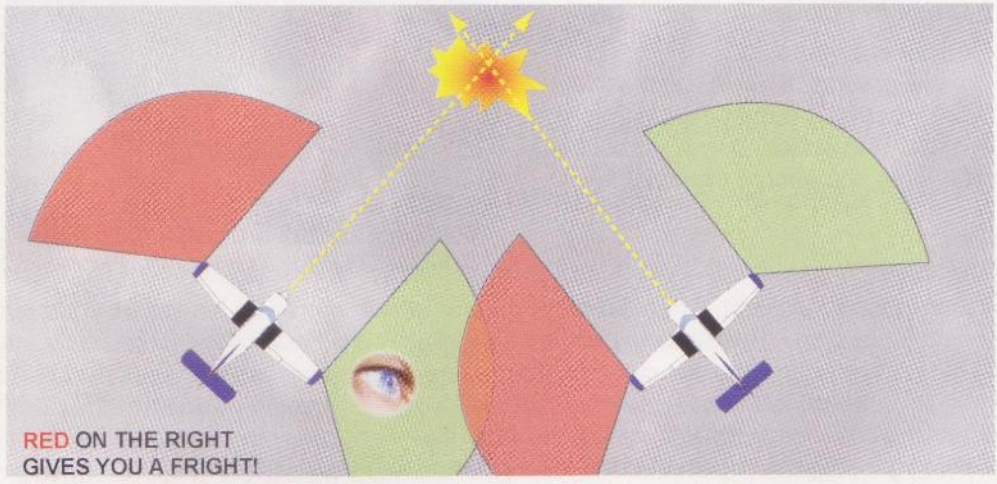


Figure 2.18 Red on the right, gives you a fright!

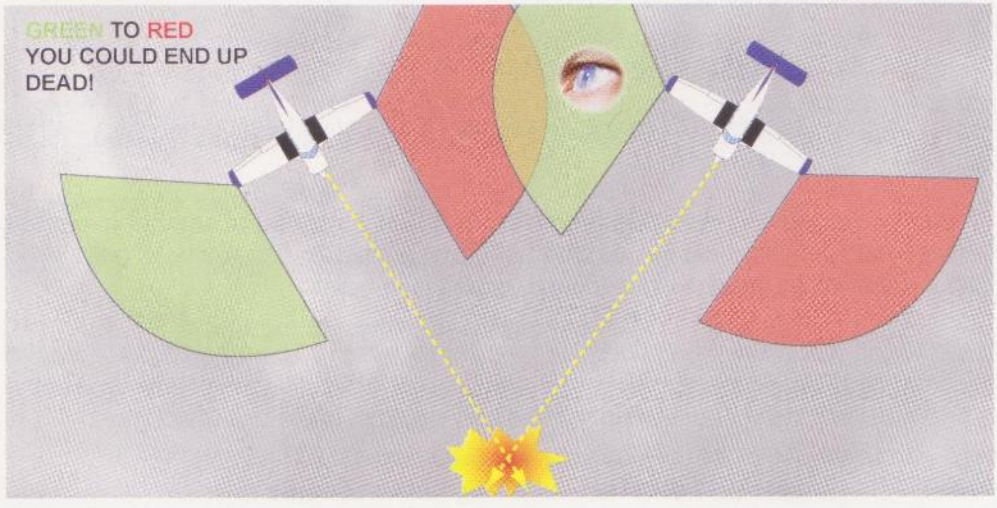


Figure 2.19 Green to Red, you could end up dead!

- If you see a **RED** light to your **LEFT** - Maintain heading and speed.

  "**Red** to **red**, go ahead".

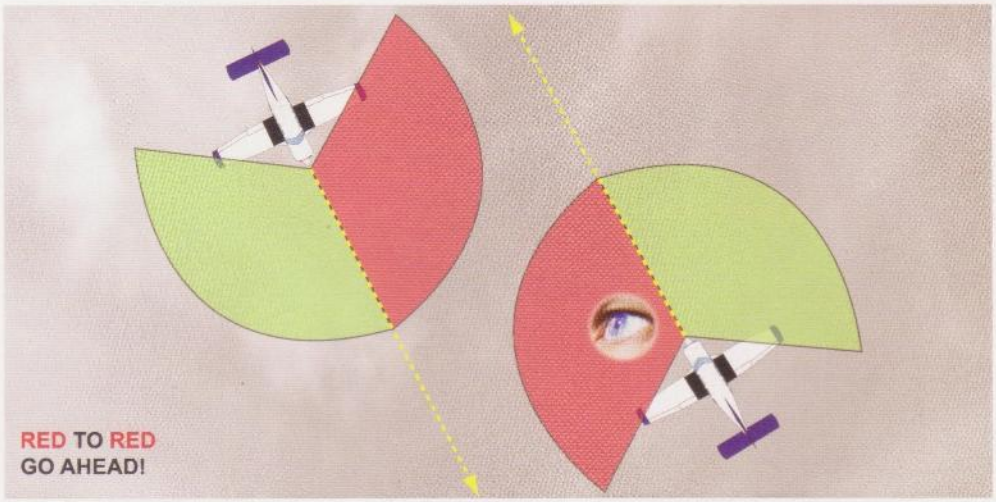


Figure 2.20 Red to Red, go ahead!

- If you see a **GREEN** light to your **RIGHT** - Maintain heading and speed.

  "**Green** to **green**, all serene".

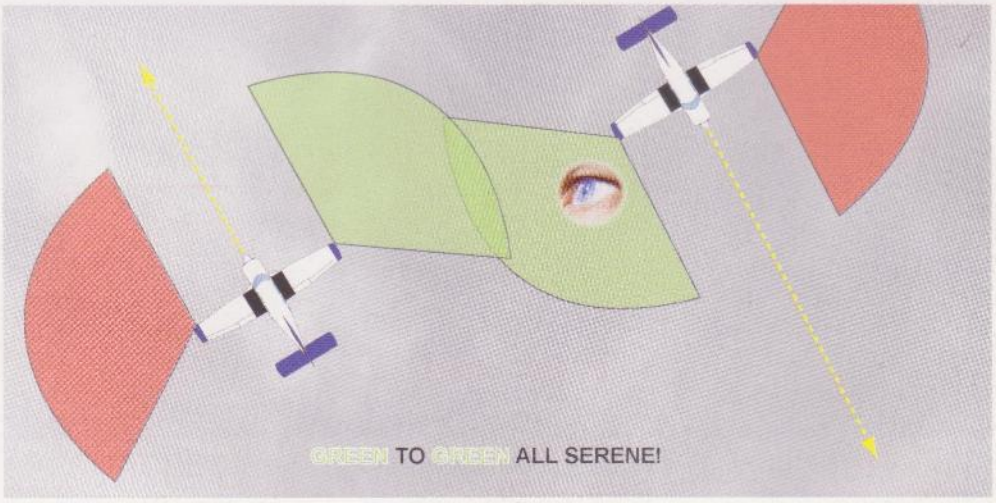


Figure 2.21 Green to Green, all serene!

- If you see a white light ahead which is getting brighter, take avoiding action by turning **RIGHT**.

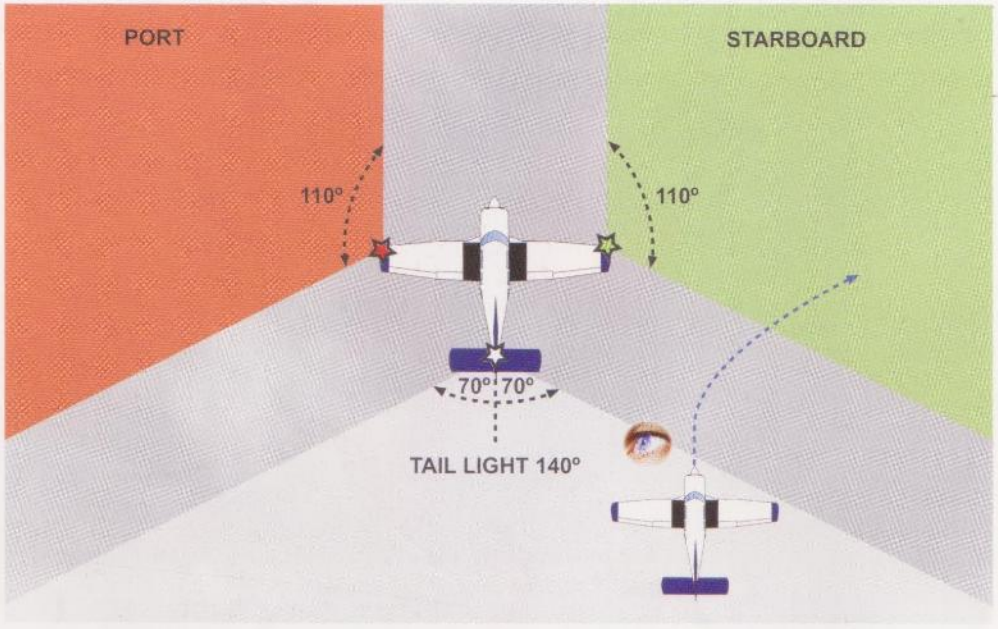


Figure 2.22 A white light ahead getting brighter - you are overtaking.

Figure 2.23 Aircraft Head-On!

- **THE ONLY TWO LIGHTS THAT A PILOT WILL SEE AT THE SAME TIME WILL BE A RED AND A GREEN AND THAT IS WHEN AN AIRCRAFT IS HEAD ON TO HIM.**

TURN RIGHT IMMEDIATELY!

RUNWAY HOLDING POSITION & STOP BARS.

An aircraft taxiing on the manoeuvring area must stop and hold at all runway-holding positions unless otherwise authorised by aerodrome traffic control. An aircraft taxiing on the manoeuvring area must stop and hold at all lighted stop bars, and may proceed further only when the lights are switched off by ATC. *(See Figures 2.24 and 2.25).*

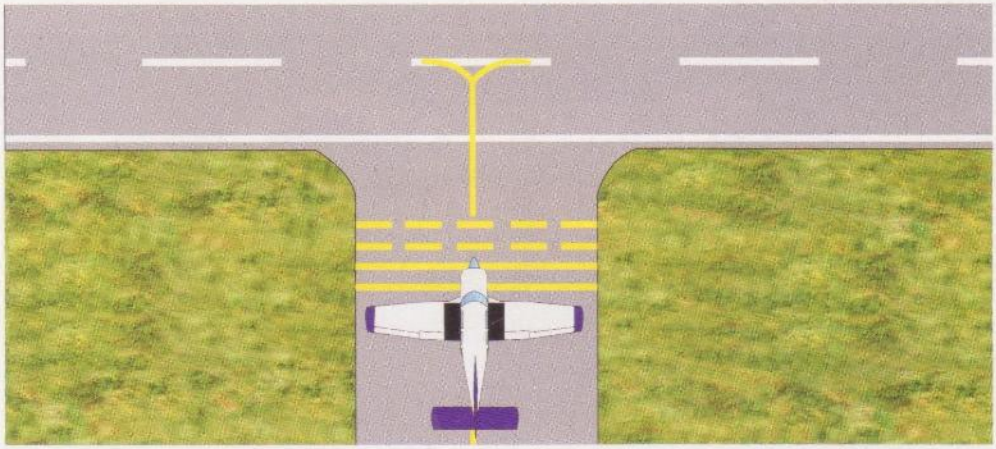


Figure 2.24 An aircraft holding at an 'A' pattern Holding Position.

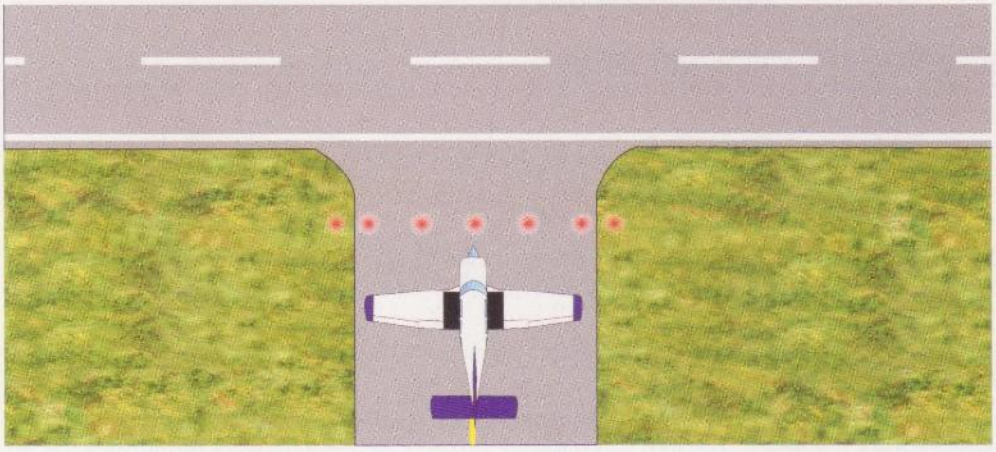


Figure 2.25 An aircraft holding at a Stop Bar.

SIMULATED INSTRUMENT FLIGHTS & PRACTICE INSTRUMENT APPROACHES.

Simulated Instrument Flights.

An aircraft must not be flown under simulated **Instrument Meteorological Conditions (IMC)** unless:

- The aircraft is equipped with dual controls.
- A qualified pilot occupies a control seat to act as safety pilot for the person who is flying under simulated instrument conditions.

An aircraft must not be flown under simulated IMC unless it is equipped with dual controls and a qualified pilot occupies a control seat.

- The safety pilot has adequate vision forward and to each side of the aircraft.

- In the event of the safety pilot not having an adequate visual field, a competent observer in communication with the safety pilot must occupy a position in the aircraft from which the observer's field of vision adequately supplements that of the safety pilot.

Figure 2.26 Simulated Instrument Flight Conditions.

Practice Instrument Approaches.

A pilot wishing to carry out a practice instrument approach can only do so when:

- In VMC.

- Carrying a competent observer.

- Having received clearance to do so by ATC.

COMMUNICATIONS FAILURES.

A controlled flight must maintain continuous two-way communication with the appropriate ATCU.

Communications Failure in VMC.

In the event of communications failure when flying Visual Meteorological Conditions (VMC) the pilot must:

- Continue to fly in VMC.

- If equipped with a transponder, squawk 7600 and select Mode C.

- Land at the nearest suitable aerodrome.

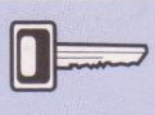
- Report his arrival by the most expeditious means to the appropriate ATCU.

Communications Failure in IMC:

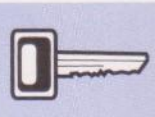
In the event of communications failure when flying in Instrument Meteorological Conditions (IMC), the pilot must:

- Maintain the last assigned speed and level, or minimum flight altitude, if higher, for a period of **20 minutes** (See Notes) following the aircraft's failure to report its position over a reporting point. Thereafter, the pilot shall adjust level and speed in accordance with the filed flight plan.
- If equipped with a transponder, squawk 7600 and select Mode C.
- Proceed according to the current flight plan route to the appropriate designated navigation aid serving the destination aerodrome.
- When required, hold over the navigation aid until commencement of descent.
- Commence descent from the navigation aid as close as possible to, the Expected Approach Time (EAT), if the pilot has received one. If no EAT is received, the pilot should commence the decent as close as possible to his flight planned Estimated Time of Arrival (ETA).
- Complete a normal instrument approach procedure.
- Land, if possible, within 30 minutes after the ETA or EAT, whichever is the later.
- Report arrival by the most expeditious means to the appropriate Air Traffic Service Unit (ATSU).

The transponder squawk for radio failure is 7600 + Mode C.



In the event of communication failures the procedure used depends upon whether the conditions are VMC or IMC regardless of whether the aircraft is operating VFR or IFR.



Notes:

If a pilot is under radar control, he should maintain the last assigned speed and level, or minimum flight altitude, if higher, for a period of **7 minutes**.

If a pilot is being radar vectored by a Radar Controller, **he must immediately revert to his filed flight plan.**

N.B.: EAT is the time at which ATC expect an aircraft to leave the hold to commence an approach.

UNLAWFUL INTERFERENCE - (HI-JACK).

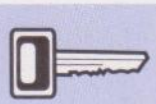
General.

Unlawful Interference is also known as Unlawful Seizure or, more commonly, hi-jack.

The law states simply that an aircraft which is being subjected to unlawful interference shall:

- Endeavour to make a detailed report as to the circumstances of the interference to the appropriate ATSU as soon as possible.
- Inform the ATSU of any necessitated deviation from the current flight. **A hi-jacked aircraft is given priority over all other aircraft.**

The transponder squawk for Unlawful Interference/Seizure is 7500 + Mode C.



The Procedure to be followed in the case of Unlawful Interference.
The most important considerations for the pilot are:

- To keep the atmosphere in the cockpit as calm as possible.
- To inform ATC by any means possible of the circumstances and – if this is not possible – any other aircraft.
- If he has filed a flight plan, to stick to the flight plan if possible until able to contact an ATSU.
- If he has a transponder, squawk 7500 and select Mode C.

If a pilot is forced to depart from track, he should:

- Attempt to broadcast warnings on the VHF Emergency frequency (121.5 MHz).
- Proceed in accordance with any special procedures for the airspace in which he is flying.
- If there are no such special procedures and he is flying in accordance with IFR, the pilot should proceed at a level that differs from the cruising level normally used for IFR traffic in the area by 300 m (1 000 feet), if above FL 290, or by 150 m (500 feet), if below FL 290.

Note:

1. ATC will not use the words "Hi-jack", "Unlawful Seizure" or "Unlawful Interference" unless these words have already been used by a member of the crew.
2. ATC will not expect replies from the aircraft and will continue to pass information/instructions and clearances to the aircraft.

INTERCEPTION.

The transponder squawk, if intercepted, is 7700 + Mode C, and contact should be made between aircraft on 121.50 MHz.

General.
Every State has the right to intercept aircraft within its territorial airspace. Nevertheless interception will only be undertaken as a last resort.

Procedure in the Event of Interception.
An aircraft which is intercepted must:

- Immediately obey the instructions given by the intercepting aircraft.
- Notify the appropriate ATSU giving as many details as possible.
- Attempt to establish radio communication with the interceptor by making a general call on **121.5 MHz** and giving the identity of the intercepted aircraft and the nature of the flight.
- If equipped, select **Code 7700 + Mode C** on the aircraft transponder.

Signals Between Intercepted and Intercepting Aircraft.
Contracting States are to ensure that the signals shown in Annex A are adhered to by their aircraft.

Confliction of Signals from Interceptor and ATC.
Should there be a confliction between the signals shown by the intercepting aircraft and instructions received from ATC, the intercepted aircraft **must obey those received from the interceptor** and advise ATC of the circumstances.

Radio Communication During Interception.
If radio contact is established during interception but communication in a common language is not possible, attempts shall be made to convey instructions, acknowledgement of instructions, and essential information by using the phrases and pronunciations in the following tables and transmitting each phrase **twice**:

PHRASES FOR USE BY INTERCEPTING AIRCRAFT		
Phrase	**Pronunciation****	**Meaning**
CALL SIGN	KOL SA-IN	What is your call sign?
FOLLOW	FOL-LO	Follow me
DESCEND	DEE-SEND	Descend for landing
YOU LAND	YOU-LAAND	Land at this aerodrome
PROCEED	PRO-SEED	You may proceed

- The call sign required to be given is that used in radiotelephony communications with Air Traffic Service Units (ATSUs) and corresponding to the aircraft identification in the flight plan.
- Circumstances may not always permit, nor make desirable, the use of the phrase 'HI-JACK'

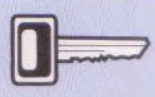
PHRASES FOR USE BY INTERCEPTED AIRCRAFT		
Phrase	**Pronunciation****	**Meaning**
CALL SIGN	KOL-SA-IN	My call sign is (call sign)
WILCO (Will comply)	WILL-KO	Understood & will comply
CAN NOT	KANN NOTT	Unable to comply
REPEAT	REE-PEET	Repeat your instruction
AM LOST	AM LOSST	Position unknown
MAYDAY	MAYDAY	I am in distress
HI-JACK #	HI-JACK	I have been hi-jacked
LAND (place name)	LAAND (place name)	I request to land at: (place name)
DESCEND	DEE-SEND	I require descent

** In the second column of both tables, syllables to be emphasized are underlined.

Circumstances may not always permit, nor make desirable, the use of the phrases "HI-JACK", "UNLAWFUL SEIZURE" and "UNLAWFUL INTERFERENCE".

VISUAL METEOROLOGICAL CONDITIONS (VMC).

A basic JAR-FCL PPL holder will, on most occasions fly in accordance with the **Visual Flight Rules (VFR)**. When flying **VFR**, the pilot must be able to manoeuvre and navigate his aircraft, and maintain separation from other aircraft, by reference to features outside the cockpit. Consequently, **VFR** flight is possible only when visibility cloud base and separation from cloud meet certain defined minima. These minima are defined as **Visual Meteorological Conditions (VMC)**. **ICAO** defines **VMC** as follows:



Visual Meteorological Conditions are conditions expressed in terms of visibility, distance from cloud, and cloud ceiling, equal to or better than specified minima.

"*meteorological conditions expressed in terms of visibility, distance from cloud, and cloud ceiling, equal to or better than specified minima.*"

These **VMC minima** vary depending on the class of airspace in which a flight is being conducted, and on the aircraft's vertical position.

ICAO VMC Visibility and Distance from Cloud Minima.

Although **VMC minima** may be expressed slightly differently in your home state, you should note that the **ICAO VMC minima** are as follows:

Altitude Band	Airspace Class	Flight Visibility	Distance From Cloud
At and above 3 050 m (10 000 feet)* AMSL	B*CDEFG **ALL AIRSPACE**	8 km	1 500 m horizontally 300 m (1 000 feet) vertically *(Class B = Clear of Cloud)
Below 3050 m (10 000 feet)* and above 900 m (3 000 feet) AMSL, or 300 m (1 000 feet) above terrain, whichever is the higher.	B*CDEFG **ALL AIRSPACE**	5 km	1 500 m horizontally 300 m (1 000 feet) vertically *(Class B = Clear of Cloud)
At and below 900 m (3 000 feet) AMSL, or 300 m (1 000 feet) above terrain, whichever is the higher.	B*CDE **CONTROLLED AIRSPACE**	5 km	1 500 m horizontally 300 m (1 000 feet) vertically *(Class B = Clear of Cloud)
	FG **UNCONTROLLED AIRSPACE**	5 km**	Clear of cloud and with the surface in sight

Notes:

* When the height of the Transition Altitude is lower than 3 050 m (10 000 feet) AMSL, FL 100 should be used in lieu of 10 000 feet.

** When so prescribed by the appropriate authority, lower flight visibilities than 1500 m may be permitted for flights operating:

a. At speeds that, in the prevailing visibility, will give adequate opportunity to observe other traffic or any obstacles in time to avoid collisions.

b. In circumstances in which the probability of encounters with other traffic would normally be low, e.g. in areas of low volume traffic or for aerial work at low levels.

(**NB.:** Helicopters may be permitted to operate in less than 1 500 m flight visibility, if manoeuvred at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.)

Note especially that VFR flight is prohibited in Class A Airspace.

ICAO VMC minima are illustrated in *Figures 2.27* and *2.28* below.

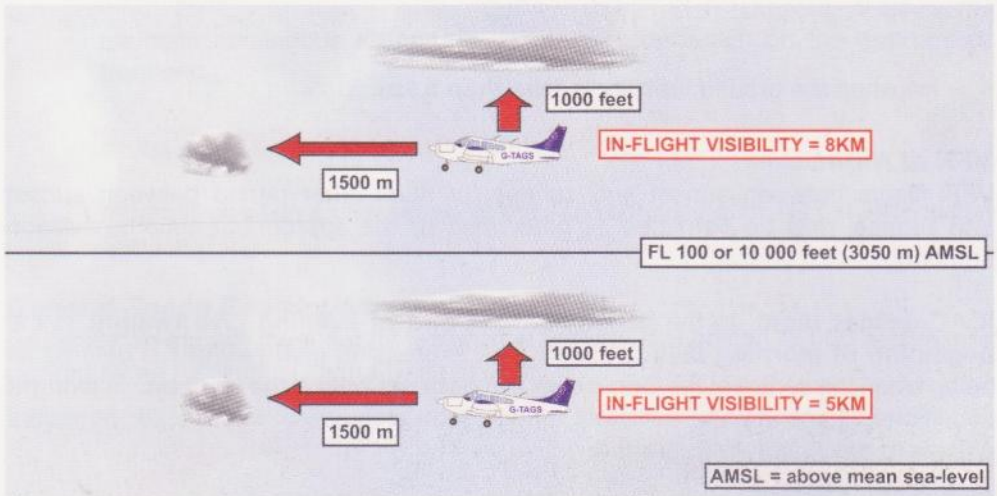


Figure 2.27 Controlled airspace classes: B, C, D & E - VMC minima.

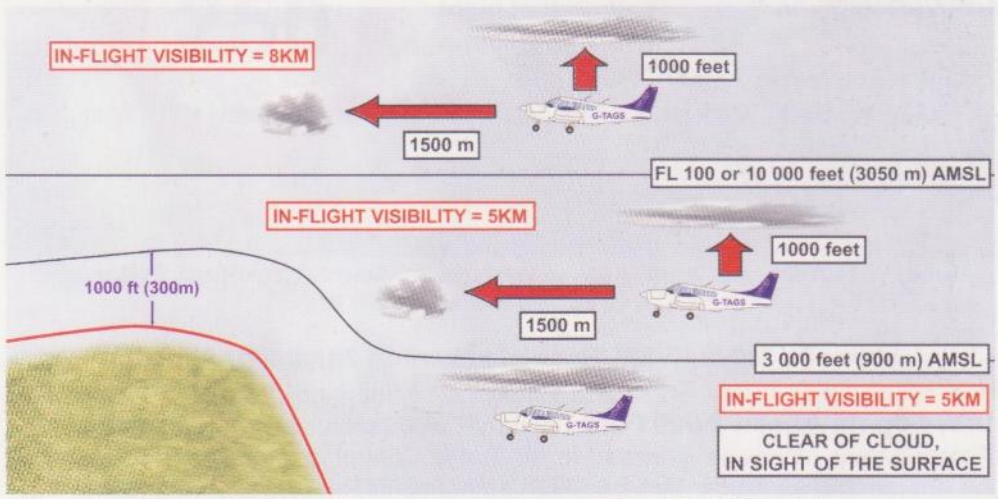


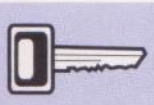
Figure 2.28 Uncontrolled airspace classes: F and G - VMC minima.

VMC minima and **VFR flight** in the various classes of **controlled** and **uncontrolled airspace** are also covered in **Chapters 5** and **13** which deal with **Airspace Division and Air Traffic Services**.

VISUAL FLIGHT RULES (VFR).

General.

Except when operating as a Special VFR flight (SVFR), flights operating in accordance with the **Visual Flight Rules (VFR)** must be conducted in **Visual Meteorological Conditions (VMC)**. In other words, a **VFR flight** must be conducted in conditions of visibility and distance from clouds equal to or greater than those specified in *Figures 2.27 and 2.28.*



All VFR flights must be conducted in VMC minima appropriate to the class of airspace which the aircraft is flying, and to its vertical position.

Minimum Conditions for Take-off, Landing and in the Traffic Pattern.

Except when a clearance is obtained from an Air Traffic Control Unit (ATCU), VFR flights shall not take off or land at an aerodrome within a Control Zone (CTR), or enter the Aerodrome Traffic Zone (ATZ) or traffic pattern:

- when the ceiling **is less than 450 m (1 500 feet),**

or

- when the ground visibility **is less than 5 km.**

VFR at Night.

VFR flights between sunset and sunrise, or such other period between sunset and sunrise, may be permitted as prescribed by the appropriate national aviation authority.

ICAO defines night as the period from the end of evening civil twilight to the beginning of morning civil twilight.

ICAO defines **night** as the period from the **end of evening civil twilight** to the **beginning of morning civil twilight**. The expression **civil twilight** is defined as being when the centre of the **Sun's disk** is **6 degrees below the horizon**. In **twilight** conditions, illumination is sufficient, under good weather conditions, for terrestrial objects to be clearly distinguished.

The UK CAA also defines night differently from ICAO *(see Chapter 10)*. In the UK, VFR operations are not allowed at night.

Other Restrictions on VFR Flights.

Unless authorised by the appropriate Air Traffic Services authority, VFR flights shall not be operated:

- **above FL 200,**

or

- **above FL 290 in RVSM (Restricted Vertical Separation Minima).**

VFR Flights Above 3 000 Feet.

Except where otherwise indicated in Air Traffic Control clearances or specified by the appropriate Air Traffic Service (ATS) authority, VFR flights in level cruising flight when operated above 900 m (3 000 feet) from the ground or water, or a higher datum as specified by the appropriate ATS authority, must be conducted at a Flight Level appropriate to the magnetic track as specified in the Tables of Cruising Levels on Page 48.

Note: the United Kingdom Flight Level system differs from that of ICAO.

VFR Flights & Clearances.

VFR flights must comply with clearance requirements when:

- operated within Classes B, C and D airspace,

- forming part of aerodrome traffic at controlled aerodromes,

or

- operated as SVFR flights.

Controlled VFR Flights and Communications.

A VFR flight operating within or into areas, or along routes, that require the submission of a flight plan must:

- maintain continuous air-ground communication watch on the appropriate frequency,

and

- report its position as necessary to the ATSU providing The Flight Information Service (FIS).

General Speed Restriction.

Generally an aircraft must not fly faster than 250 kts IAS below 10 000 feet unless cleared by an Air Traffic Control Unit (ATCU).

Figure 2.29 The Rules: Generally an aircraft shall not fly faster than 250 kts IAS below 10 000 feet unless cleared by ATS.

Changing from VFR to IFR.

The pilot of an aircraft operated in accordance with the Visual Flight Rules who wishes to change to Instrument Flight Rules must:

- if a flight plan was submitted, communicate the necessary changes to his current flight plan,

or

- when required, submit a flight plan to the appropriate ATCU and obtain a clearance prior to proceeding in accordance with IFR when in controlled airspace.

The cruising Flight Level is dependent on the aircraft's magnetic track and its flight rules.

Flight Level Cruising Rules.

An aircraft flying **above the Transition Altitude** must fly at **Flight Levels** based on a pressure altimeter setting of **1013.2 hPa** dependent on the **magnetic track** of the aircraft, in accordance with the **Semi-Circular Rule**, as shown in the following table of cruising levels.

TRACK							
From 000 to 179 degrees				From 180 to 359 degrees			
IFR Flights		VFR Flights		IFR Flights		VFR Flights	
FL	Feet	FL	Feet	FL	Feet	FL	Feet
10	1000	-	-	20	2000	-	-
30	3000	35	3500	40	4000	45	4500
50	5000	55	5500	60	6000	65	6500
70	7000	75	7500	80	8000	85	8500
90	9000	95	9500	100	10000	105	10500
110	11000	115	11500	120	12000	125	12500
130	13000	135	13500	140	14000	145	14500
150	15000	155	15500	160	16000	165	16500
170	17000	175	17500	180	18000	185	18500
190	19000	195		200	20000	205	
210	21000	215		220	22000	225	
230	23000	235		240	24000	245	
250	25000	255		260	26000	265	
270	27000	275		280	28000	285	
290	29000			300	30000		
310	31000			320	32000		
330	33000			340	34000		
350	35000			360	36000		
370	37000			380	38000		
390	39000			400	40000		
410	41000			430	43000		
450	45000			470	47000		
490	49000			510	51000		

Figure 2.30 Table of cruising levels - the Semi-Circular Rule.

Difference Between ICAO and UK Flight Level Cruising Rules.

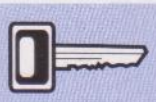
One of the major differences between **ICAO Flight Level Cruising Rules** and the **United Kingdom Flight Level Cruising Rules** is that the ICAO Rules make a distinction as to whether a flight is operating under **VFR** or **IFR in addition to** the magnetic track of the aircraft. Therefore, the ICAO Semi-Circular Rule gives separate **VFR** and **IFR** cruising levels. (*See Figure 2.30.*) Over the UK, on the other hand, the **Flight Level Cruising Rules** depend only on the magnetic track of the aircraft. In other words, UK has no **VFR Flight Levels**, although this may change in the future.

A second major difference is that, in the United Kingdom, above the Transition Altitude and below **Flight Level 195**, outside controlled airspace, IFR flights follow a Quadrantal Rule, not the Semi-Circular Rule. Furthermore, in the UK, VFR flights are not obliged to follow any Flight Level Cruising Rule, outside controlled airspace. The United Kingdom Rules are covered in full in Chapter 10.

SPECIAL VFR (SVFR).

General.
A **SVFR Flight** is a **VFR flight** cleared by an **Air Traffic Control Unit (ATCU)** to operate within a **Control Zone (CTR)** in meteorological conditions **below VMC**.

SVFR is permitted only in a Control Zone (CTR).



The important points to remember about **SVFR** are:

- A **SVFR** clearance is not a pilot's right and is granted by an **ATCU** only when traffic conditions allow, after a request has been made by the pilot.
- A **SVFR** flight must obey all instructions from the **ATCU.**
- A **SVFR** flight must remain clear of cloud and in sight of the ground at all times.
- A **SVFR** flight is allowed only within a **CTR.**
- Separation is provided between **SVFR** aircraft and all IFR traffic.
- Two-way communications are mandatory. It should be noted that if a pilot has received a **SVFR** clearance to enter a **CTR** and experiences a communications failure prior to entry, **the pilot must remain clear of the CTR.**
- A pilot may request **SVFR** in flight or prior to take-off from an aerodrome in the **CTR.**

MINIMUM CONDITIONS FOR SVFR.

A ground visibility of not less that 1 500 m is required before a SVFR flight can be authorised to:

a. enter a **CTR.**
b. take-off and depart from a **CTR.**
c. cross, or operate locally within a **CTR.**

In-flight requests for **SVFR** should be made at least **10 min before entering a CTR.**

MINIMUM HEIGHTS AND LOW FLYING.

Congested Areas and Open-Air Assemblies.
Except as necessary for take-off or landing, or except by permission from the appropriate authority, a VFR flight must not be flown over the congested areas of cities, towns or settlements, or over an open-air assembly of persons, at a height **less than 1 000 feet (300 m)** above the highest obstacle **within a radius of 600 m from the aircraft**, or below a height which will permit the aircraft to land clear of persons or property on the ground, in the event of an engine failure, whichever is the higher.

An aircraft is not permitted to fly over a congested area below 1000 feet above the highest fixed obstacle within 600 metres of the aircraft, except as necessary for take-off or landing.

Except for the purpose of take-off and landing, no aircraft is to fly at a height less than 500 feet above ground or water.

Low Flying Absolute Minima.

Except for the purpose of landing and taking-off or with the permission of the appropriate authority, no aircraft is to fly at a height less than **500 feet (150 m**) above the ground or water.

THE VISUAL CIRCUIT.

The **Visual Circuit** is a traffic pattern which imposes order on aerodrome traffic taking off, landing and flying in the immediate vicinity of an aerodrome. At a controlled aerodrome, the **Visual Circuit** is controlled by **Aerodrome Control**, usually from the **Air Traffic Control Tower**.

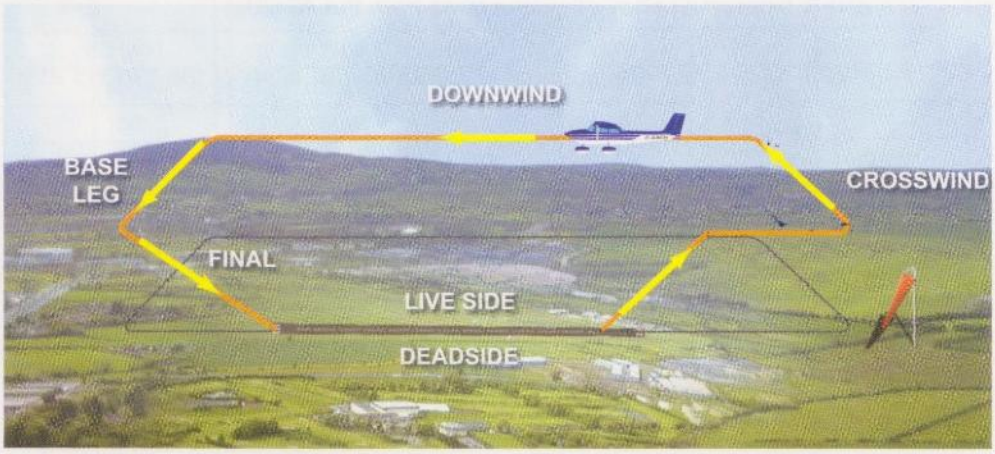


Figure 2.31 The Visual Circuit. Aircraft must conform to the traffic pattern being followed by other aircraft operating at an aerodrome.

All aircraft must either conform to the traffic pattern (circuit) being followed by other aircraft operating at an aerodrome, or else keep clear of the **Visual Circuit**.

The Standard Circuit.

The **Standard Circuit** is a **left-hand circuit** consisting of 4 "**legs**" as shown in the diagram below. In a **left-hand circuit**, all turns are made to the **left**.

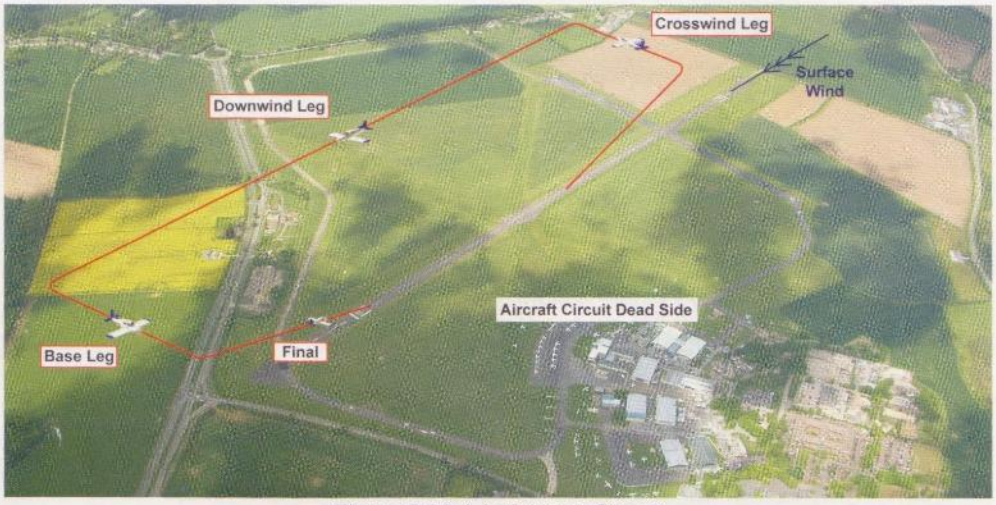


Figure 2.32 A Left Hand Circuit.

A standard visual circuit is LEFT - hand. This means that all turns are to be made to the left.

If, for some operational reason, there is a **right-hand circuit** in force a pilot will normally be advised by the responsible **Air Traffic Service Unit (ATSU)** over the radio prior to joining the circuit. For aircraft with no radio there are **designated signals** in the **signals square** which inform pilots of the **circuit direction** in force *(see Annex A)*. If an aircraft is not fitted with a radio, the pilot should plan to carry out an overhead join to the aerodrome and make a careful check of the **signals square**.

If a pilot with a serviceable radio is in doubt about the circuit direction in force, he should confirm the direction with the ATSU.

Representative PPL - type questions to test your theoretical knowledge of ICAO Rules of the Air.

1. When two aircraft are converging at approximately the same level the one that has the other on its right is required to give way. True or false?

   a. True, provided they are in the same class
   b. False. The one that has the other on its left is required to give way
   c. True, unless the other aircraft has a glider on tow
   d. The Rules of the High Seas apply

2. An aircraft is not permitted to fly over a congested area below 1000 feet above the highest fixed obstacle within 600 metres of the aircraft, except in the following circumstances:

   a. When carrying out a practice forced landing
   b. When necessary to fix one's position on a cross-country flight
   c. When landing or taking off
   d. When carrying out a low flying exercise with a qualified flying instructor

3. What is the definition of Visual Meteorological Conditions (VMC)?

   a. Meteorological conditions in which all flights must take place in accordance with the Visual Flight Rules (VFR)
   b. A set of rules which defines how aircraft are to be flown with reference to external, visual features
   c. Meteorological conditions in which only VFR flights may take place
   d. Meteorological conditions expressed in terms of visibility, distance from cloud, and cloud ceiling, equal to or better than specified minima

4. What is the basic presumption about VFR flight?

   a. That the pilot holds the correct rating to allow the aeroplane to be flown in VFR
   b. That the flight will be flown in Visual Meteorological Conditions
   c. That the flight will only take place in Class F or G airspace
   d. That the flight will not take place above FL180

5. In uncontrolled airspace, below FL 100, and above 3 000 feet AMSL or 1 000 feet above terrain, whichever is the higher, what are the VMC minima?

   a. Clear of cloud and in sight of the surface with an in-flight visibility of 5 km
   b. 1 000 feet vertical and 1 500 m horizontal separation from cloud with an in-flight visibility of 5 km
   c. 1 000 feet vertical and 1 500 m horizontal separation from cloud with an in-flight visibility of 8 km
   d. Clear of cloud with an in-flight visibility of 8 km

6. An aircraft following a road, railway line, river, canal or other line feature should keep such a feature:

   a. On its left
   b. On its right
   c. Directly underneath it
   d. On its left during the day and on the right at night

7. With certain exceptions, an aircraft must not fly closer than _____ feet to any person, vessel, vehicle or structure unless it is landing or taking off in accordance with normal aviation practice. Select the correct minimum separation distance from the following options:

   a. 1 000 feet
   b. 500 feet
   c. 1 500 feet
   d. 1 000 m

8. When a pilot, for the purposes of practising instrument flight, is flying under simulated Instrument Meteorological Conditions such that his ability to see outside the cockpit is artificially restricted, which of the following regulations applies?

   a. An observer must also be present in the cockpit
   b. The exercise must be carried out at a licensed airfield
   c. An appropriately qualified safety pilot must be present in one of the control seats. If necessary, an additional observer may need to be carried to ensure that an adequate lookout is being kept
   d. The exercise must be carried out as part of a commercial or air transport pilot's licence flying training course at an approved Flying Training Organisation

9. Which SSR Code should be selected to indicate radio failure?

   a. 7700 + Mode C
   b. 7500 + Mode C
   c. 7000
   d. 7600 + Mode C

10. The definition "flying machine" may refer to:

    a. Any aircraft of any category or classification
    b. Fixed wing aircraft only
    c. Gliders and power-driven aeroplanes or dirigibles
    d. Any heavier-than-air, power-driven aircraft

11. You are about to overtake an aircraft at night from a position behind and almost immediately astern of the other aircraft. Which of its navigation lights will you see?

    a. A white and a red light
    b. A white light only
    c. It depends on which side you are overtaking the other aircraft
    d. A white and a green light

12. When flying in accordance with the Visual Flight Rules in uncontrolled airspace, responsibility for maintaining VMC and terrain clearance rests with:

    a. Any Air Traffic Control Unit with whom the pilot is in contact
    b. The Pilot-in-Command
    c. Any radar controller with whom the pilot is in contact
    d. Any Air Traffic Service Unit with whom the pilot is in contact

13. The definition of night, unless otherwise specified by a national aviation authority is:

    a. From the end of evening civil twilight to the beginning of morning civil twilight
    b. From the beginning to the end of civil twilight
    c. From the beginning of evening civil twilight to the end of morning civil twilight
    d. From the end of morning civil twilight to the beginning of evening civil twilight

14. If two aircraft are converging while taxiing on the apron, what is the priority rule?

    a. The aircraft which has the other aircraft on its right shall give way
    b. The aircraft which has the other aircraft on its left shall give way
    c. The aircraft which is farthest from a taxiway centre line shall give way
    d. The smaller of the two aircraft shall give way

15. The navigation lights of a flying machine or airship should cover the following arcs: green and red wingtip-lights _____ degrees each side from dead ahead and a white tail-light _____ degrees either side of dead astern.

    a. 220 140
    b. 110 70
    c. 100 90
    d. 90 90

16. Which of a), b), c) and d) below, most correctly completes the following statement?

When two or more aircraft are on final approach:

a. The lower aircraft has the right of way unless ATC has already specified a landing order
b. The lower performance aircraft has right of way
c. The higher aircraft has the right of way
d. The aircraft which has the least horizontal distance to run to the runway threshold has the right of way

17. Which of a), b), c) and d) below, provides the most correct conclusion to the following statement?

In order to minimise the risk of collision, the following rules apply when aircraft of different categories are converging:

a. Powered aeroplanes must give way to airships, gliders and balloons
b. Gliders must give way to powered aeroplanes and airships
c. Airships must give way to powered aeroplanes, gliders and balloons
d. Tug-aircraft with a glider on tow must give way to all other airspace users

18. Complete the following sentence correctly. Except with permission of the Authority:

a. No aircraft shall fly within 500 feet of an open-air gathering of more than 500 people
b. No aircraft shall fly within 500 feet of an open-air gathering of more than 1 000 people
c. No aircraft shall fly within 1 000 feet of an open-air gathering of more than 500 people
d. No aircraft shall fly within 1 000 feet of an open-air gathering of more than 1 000 people

19. While flying at night, as the Pilot-In-Command, you see an anti-collision light and a steady red light at the same altitude, which maintain a constant relative bearing from you of 050 degrees. Is there a risk of collision? And who has right of way?

a. Yes. You do
b. Yes. The other aircraft does
c. No. The other aircraft does
d. No. You do

20. As you are taxiing back to the apron you encounter a tractor towing an aircraft. Your correct course of action is to:

a. Stop
b. Continue because you have right of way
c. Turn right
d. Give way to the tractor/aircraft combine; it has the right of way

21. You are IFR in VMC and experience a communication failure. Your correct actions are to:

a. Adhere to your flight plan and continue to your destination
b. Continue in VMC and land at the nearest suitable aerodrome and report your arrival to the appropriate ATSU
c. Land immediately
d. Adhere to your last ATC clearance for 20 minutes and then revert to your filed flight plan continuing to your planned destination

22. You are intercepted by a fighter aircraft. On which frequency would you try and establish contact?

a. The frequency with which you are in contact at the moment of interception
b. 121.5 MHz
c. 2182 MHz
d. 500 KHz

23. Whilst maintaining a steady course, level and speed you see another aircraft in your 2 o'clock about 4 nautical miles away and at the same level as yourself. The danger of collision exists if the other aircraft:

a. Appears to get bigger
b. Remains in the same relative position
c. Appears to be overtaking you, by moving towards your 12 o'clock
d. Appears to be dropping behind you, moving towards your 4 o'clock

24. When are navigation lights required to be shown?

a. When moving on the manoeuvring area of an aerodrome
b. From sunset to sunrise or when specified by the Authority
c. Whenever the Pilot-In-Command thinks it is sensible to switch them on
d. At night or when specified by the authority

25. If two aircraft are approaching head on:

a. Both aircraft must turn left
b. A powered aircraft must give way to a glider by turning right
c. Both aircraft should turn right regardless of aircraft type
d. The larger aircraft should give way by turning right

26. If you were following a river which flows from east to west while maintaining a track of 270° True, which side of the river must you fly?

a. To the North of the river, because you must fly to the right of the line feature
b. To the South of the river, because you should fly to the left of the line feature
c. Directly overhead the river
d. Either side of the river as long as you keep a good look out for other aircraft

27. You see a red light of another aircraft on your right and it remains on a constant relative bearing. What must you do?

a. Continue to maintain heading and speed, keeping a good watch on the other aircraft
b. Take avoiding action; you are probably on a collision course
c. Continue to maintain heading, altitude and speed, keeping a good watch on the other aircraft
d. Immediately descend

28. You see a red and green light of another aircraft straight ahead of you. What must you do?

a. Immediately turn left
b. Immediately turn right
c. Immediately descend
d. Immediately climb

29. During the course of a night flight, you notice that a navigation light has failed; the correct action to be followed is:

a. Make a "PAN" call on the frequency in use and proceed on planned route to destination
b. Land as soon as practically possible unless permission to continue to your destination is given by the appropriate ATCU
c. If the anti-collision light is working, switch off the navigation lights and continue to destination
d. Land at the nearest suitable airfield

30. You see a red light of another aircraft on your left. What must you do?

a. Continue to maintain heading and speed, keeping a good watch on the other aircraft; the aircraft is heading in an opposite direction to you
b. Take avoiding action
c. Continue to maintain heading, altitude and speed, keeping a good watch on the other aircraft
d. Immediately descend

31. In level flight at night, from your aircraft, you see an anti-collision beacon and a red navigation light. The lights are at the same altitude as yourself and are steady at 2 o' clock and closing. This indicates that there is:

a. An airship which should give way to you
b. A flying machine which should give way to you
c. A flying machine to which you should give way
d. No threat

32. An aircraft is considered to be overtaking another when the faster aircraft is approaching from behind within:

a. 10° of the extended centreline of the aircraft
b. 20° of the extended centreline of the aircraft
c. 70° of the extended centreline of the aircraft
d. 80° of the extended centreline of the aircraft

33. During a flight, by day, a pilot notices that an anti-collision light is inoperative. Which of the following actions is correct?

a. He should land as soon as safe to do so unless authorised by ATC to continue the flight
b. He may continue flight by day provided that the light is repaired at the earliest practical opportunity
c. He must land as soon as possible and get the light repaired
d. Provided the aircraft is flown VFR only, the problem may be ignored

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer												

Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer												

Question	25	26	27	28	29	30	31	32	33
Answer									

The answers to these questions can be found at the end of this book.

CHAPTER 3
REGISTRATION (ICAO)

NATIONALITY, COMMON & REGISTRATION MARKS.

DEFINITIONS.

Nationality Mark.

The nationality mark consists of a character (letters and/or numbers) issued by the State of Registration of the aircraft which denote the nationality of the aircraft. For example, UK registered aircraft have the nationality mark of "G"; the nationality mark of the United States is "N" and that of Syria is "SY".

Figure 3.1 A UK registered aircraft showing the Nationality Mark and its registration.

The State of Registration issues an aircraft with its Registration Marking.

Common Mark.

Should an aircraft belong to an international operator, registered in more than one state, it is issued with a Common Mark in place of a nationality mark by ICAO. For instance, the common mark 4YB has been issued by ICAO to Jordan and Iraq for registering aircraft operated by the company Arab Air Cargo.

The Registration mark is issued by the State of Registry.

Registration Mark.

The Registration Mark is issued to the aircraft by the State of Registry and follows the common or nationality mark. For example if an aircraft is designated G-ABCD, "G" is the nationality mark, and "ABCD" is the registration mark.

Issuing Authorities.

- A nationality mark is chosen by the State from the symbols allocated to it by the International Telecommunication Union. The State then notifies ICAO of which Nationality Mark has been selected.
- The Common Mark is issued to the Common Mark Registering Authority by ICAO.
- The Registration Mark is allocated to the aircraft by the State of Registry (or, in the case of an aircraft belonging to an international agency, by the Common Mark Registering Authority).

The Nationality Mark originates from The International Telecommunications Union.

Unusable Letter Combinations for Registration Marks.

Letter combinations are not to be used for the registration mark which might be confused with:

- The 5 letter combinations used in the International Code of Signals (for example flag signals used in Maritime operations).
- 3 letter combinations starting with the letter Q used in the Q Code (e.g. QNH, QFF, QDM etc.).
- The distress and urgency signals SOS, PAN, XXX.
- TTT, which is morse code for safety / sécurité.

All Nationality and Registration marking are to be kept clean and visible at all times.

Characteristics and Location of Markings.

- All markings are to be painted, or affixed by any other means which ensure the same degree of permanence.
- They are to be kept clean and visible at all times.
- On heavier-than-air aircraft, the marking shall be on the:

  a. lower surface of the wings,

  and

  b. on each side of the fuselage or on the upper parts of the vertical tail surfaces.

Size of Markings.

On heavier-than-air aircraft, the markings shall be at least:

- **50 cms in height on the wings,**

  and

- **30 cms in height on the fuselage and vertical tail surfaces.**

Dispensation from Markings.

It is possible, with special permission, to dispense with markings on, for example, historic aircraft. However, this must be agreed on an individual basis with the Authority concerned.

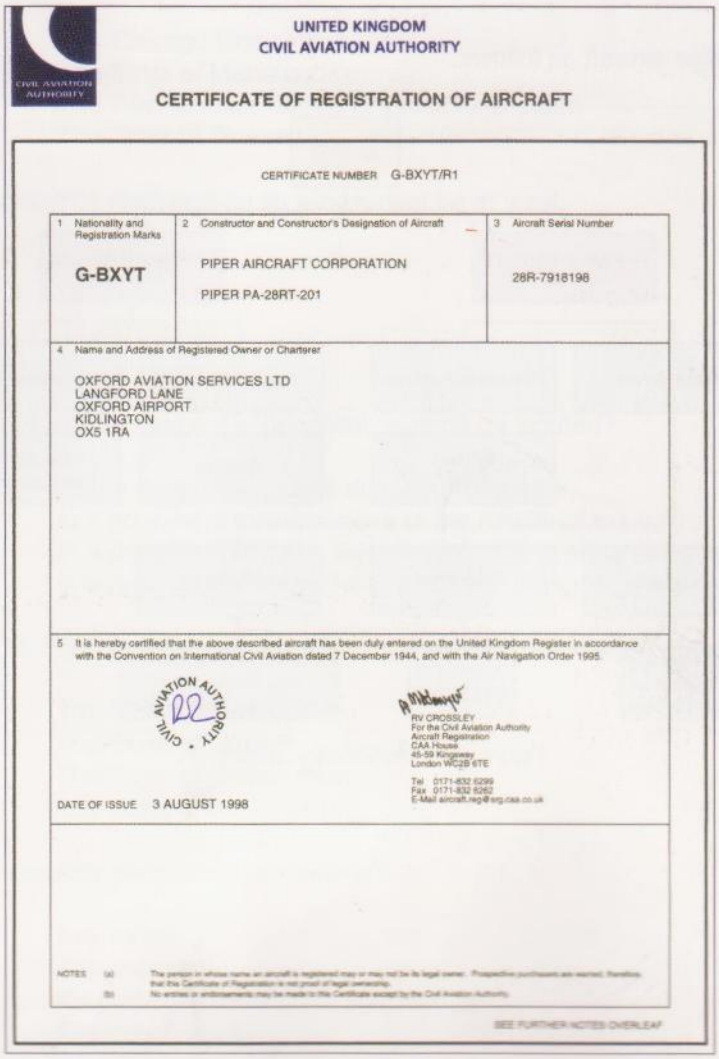
1. The State of Registry issues the C of R in respect of an aircraft.
2. It must be carried in the aircraft at all times.

The State of Registry will issue a Certificate of Registration (C of R) to the aircraft concerned, which must be carried in the aircraft at all times.

CONTENT OF THE CERTIFICATE OF REGISTRATION (C OF R).

The C of R certifies that the State of Registry has registered the aircraft. The C of R details comprise the following:

- The Nationality or Common Mark.
- The Registration Mark.
- The manufacturer's designation of the aircraft.
- The serial number of the aircraft.
- The name and the address of the owner.
- A certified statement that the aircraft has been entered on the registry of the State.
- The dated signature of the Registering Officer.



UNITED KINGDOM
CIVIL AVIATION AUTHORITY

CERTIFICATE OF REGISTRATION OF AIRCRAFT

CERTIFICATE NUMBER G-BXYT/R1

1 Nationality and Registration Marks	2 Constructor and Constructor's Designation of Aircraft	3 Aircraft Serial Number
G-BXYT	PIPER AIRCRAFT CORPORATION PIPER PA-28RT-201	28R-7918198

4 Name and Address of Registered Owner or Charterer

OXFORD AVIATION SERVICES LTD
LANGFORD LANE
OXFORD AIRPORT
KIDLINGTON
OX5 1RA

5 It is hereby certified that the above described aircraft has been duly entered on the United Kingdom Register in accordance with the Convention on International Civil Aviation dated 7 December 1944, and with the Air Navigation Order 1995.

CIVIL AVIATION AUTHORITY

RV CROSSLEY
For the Civil Aviation Authority
Aircraft Registration
CAA House
45-59 Kingsway
London WC2B 6TE

Tel 0171-832 5299
Fax 0171-832 5262
E-Mail aircraft.reg@srg.caa.co.uk

DATE OF ISSUE 3 AUGUST 1998

NOTES (a) The person in whose name an aircraft is registered may or may not be its legal owner. Prospective purchasers are warned, therefore, that this Certificate of Registration is not proof of legal ownership.
(b) No entries or endorsements may be made in this Certificate except by the Civil Aviation Authority.

SEE FURTHER NOTES OVERLEAF

Figure 3.2 Certificate of Registration (C of R).

Application for Registration.
The application for registration must include the aircraft's correct classification. (*See Figure 3.3* below.)

IDENTIFICATION PLATE.

The identification plate inscribed with the aircraft Registration Mark should be made from fireproof metal or other fireproof material.

Identification Plate:

All aircraft are to carry an identification plate made of fire-proof material which must be secured to the aircraft in a prominent position near the main entrance.

- **All aircraft are to carry an identification plate which must be inscribed with, at least, its nationality/common mark and its registration mark.**
- **The identification plate must be made of fire-proof metal or other fire-proof material.**
- **The identification plate must be secured to the aircraft in a prominent position near the main entrance.**

Note: The identification plate is a requirement of ICAO Annex 7 but is not mandatory under the UK Air Navigation Order.

CLASSIFICATION OF AIRCRAFT – ICAO.

ICAO classifies aircraft as follows:

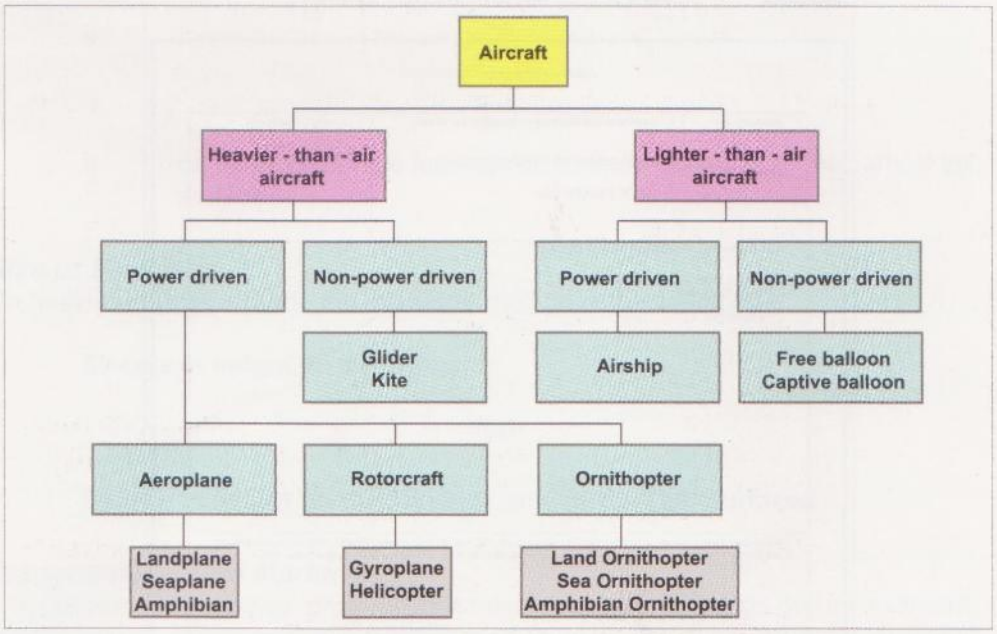


Figure 3.3 Classification of Aircraft.

Representative PPL - type questions to test your theoretical knowledge of ICAO Registration.

1. What is a Common Mark?

   a. The markings of an aircraft that has not received a C of A
   b. The markings of an aircraft owned by an international agency
   c. The markings of an aircraft owned by two or three different operators
   d. The markings of an aircraft that is shared by two owners

2. Which of the following would be an illegal registration marking?

   a. MINE
   b. PPP
   c. TTT
   d. YOU

3. From which organisation does the Nationality Mark originate?

   a. The Chicago Convention
   b. The State of Manufacture
   c. The International Telecommunications Union
   d. The State of Design

4. An aircraft's markings on its wings must be at least:

   a. 30 cms high
   b. 30 inches high
   c. 50 inches high
   d. 50 cms high

5. Where must an aircraft's identification plate be located?

   a. Inside the pilot's access door by the handle
   b. In a prominent location close to the middle of the instrument panel
   c. In a prominent location anywhere on the outside of the fuselage
   d. In a prominent location near the main entrance

6. Which State is responsible for issuing the registration mark of an aircraft?

   a. The State of Manufacture
   b. The State of Design
   c. The State of Registration
   d. The State of the Operator

7. The identity plate must be made of:

   a. Any metal
   b. Any material
   c. No particular material is specified
   d. Fire-proof metal

Question	1	2	3	4	5	6	7
Answer							

The answers to these questions can be found at the end of this book.

CHAPTER 4
AIRWORTHINESS (ICAO)

CIVIL AVIATION AUTHORITY

UNITED KINGDOM
CIVIL AVIATION AUTHORITY

Certificate No: 050008/002

CERTIFICATE OF AIRWORTHINESS

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-BXYT	PIPER AIRCRAFT CORPORATION PIPER PA-28RT-201	28R-7918198

TRANSPORT CATEGORY (PASSENGER) — **Date of Expiry:** 9 SEPTEMBER 2004

This Certificate of Airworthiness is issued pursuant to the Convention on International Civil Aviation dated 7 December 1944, and to the Civil Aviation Act 1982, and the Orders and Regulations made thereunder, in respect of the above-mentioned aircraft which is considered to be airworthy when maintained and operated in accordance with the foregoing and the pertinent operating limitations. The CAA Approved Flight Manual forms part of this Certificate.

Date of Validity: 10 SEPTEMBER 2001

for the Civil Aviation Authority

Note: Following replacement, this Certificate of Airworthiness will cease to be in force and should be returned to the address below.

No entries or endorsements may be made on this Certificate except by an authorised person. If this Certificate is lost, the Civil Aviation Authority should be informed at once. Any person finding this Certificate should forward it immediately to the Civil Aviation Authority, Safety Regulation Group, Aviation House, South Area, Gatwick Airport, West Sussex, RH6 0YR.

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AIRWORTHINESS OF AIRCRAFT - ICAO ANNEX 8.

General.

All Contracting States are responsible for ensuring that:

- **Aircraft registered with their own State are airworthy**

  and

- **that there are procedures to ensure the aircraft's continuing airworthiness.**

All States are responsible for the continuing airworthiness of their aircraft.

To this end and to meet the appropriate standards, states are to issue their aircraft with a Certificate of Airworthiness. A Certificate of Airworthiness issued by a contracting state is to be recognised by other contracting states.

An aircraft is deemed to be airworthy when it complies with the operational and maintenance limitations specified in the:

- Aircraft Flight Manual.
- Aircraft placards.
- ICAO Airworthiness Technical Manual.

Temporary Loss of Airworthiness.

Any failure to maintain an aircraft in an airworthy condition shall render the aircraft ineligible for operation until the aircraft is restored to an airworthy condition.

A Certificate of Airworthiness (C of A):

- Shall be issued by the State of Registry.
- Shall remain valid subject to the laws of the State of Registry.
- Shall be recognised as valid by other Contracting States if it was issued in accordance with ICAO requirements and standards.
- Shall consist of the following details (*See Figure 4.1.*)

  a. Aircraft Nationality and Registration marks.

  b. Name of aircraft manufacturer and manufacturer's designation of the aircraft (type and model).

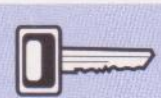
  c. Aircraft serial number.

  d. Aircraft Category (Aircraft Classification).

  e. A statement that the aircraft is airworthy.

  f. Date of issue.

The State of Registry is not only responsible for issuing a C of A to an aircraft but is also responsible for the continuing airworthiness of that aircraft.



g. The dated signature of a qualified member of the Authority.

h. Date of expiry.

Certificate of Airworthiness.

UNITED KINGDOM
CIVIL AVIATION AUTHORITY

CERTIFICATE OF AIRWORTHINESS

Certificate No: 050008/002

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-BXYT	PIPER AIRCRAFT CORPORATION PIPER PA-28RT-201	28R-7918198

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Figure 4.1 Certificate of Airworthiness.

Validity of Certificate of Airworthiness.

In general, the period of validity of a Certificate of Airworthiness (C of A) is up to the date marked on the C of A, itself.

However, for an aircraft regulated by the European Aviation Safety Agency (EASA), from September 2006, C of As will be issued for 12 months only. From 28 September 2007, EASA C of As are planned to be issued in a non-expiring format, and will be supported by a document called the Airworthiness Review Certificate. Full compliance with EASA regulations by EASA member states is envisaged being required from September 2008.

CONTINUING AIRWORTHINESS.

The State of Registry is to ensure that procedures are followed to ensure the continued airworthiness of the aircraft.

- A Certification of Airworthiness (C of A) is considered to be invalid if the aircraft is modified, repaired or maintained in other than the manner approved by the Authority.

- Should a C of A be invalidated, the aircraft shall not participate in international navigation except with the permission and approval of the State whose territory is entered.

INSTRUMENTS AND EQUIPMENT.

The aircraft must be provided with approved instruments and equipment necessary for the safe operation of the aircraft in the anticipated operating conditions.

Safety & Survival Equipment.

The prescribed safety & survival equipment that the crew or passengers are expected to use in an emergency are to be:

- Reliable.
- Readily accessible.
- Easily identifiable.
- Plainly marked as to method of operation.

Figure 4.2 A Life Jacket.

Never forget to check the survival equipment of your aircraft!

Aircraft Lights.

Aircraft lights are to be installed in such a manner as to minimize the possibility that they may:

- Adversely affect the satisfactory performance of the flight crew.
- Subject an outside observer to harmful dazzle.

Figure 4.3 A Warrior at night.

AIRCRAFT OPERATING LIMITATIONS AND INFORMATION.

General.

The aircraft's operating limitations and other information necessary for the safe operation of the aircraft must be made available in the aircraft's:

- Flight Manual (and/or pilot's Operating Handbook).
- Markings and placards.

Aircraft operating limitations are contained in the aircraft's Flight Manual.

Aircraft Operating Limitations.
As a minimum, the following limitations must be made available:

- ***Loading.*** All limiting masses (weights), C of G positions, weight distribution and floor loadings.
- ***Airspeed.*** Limiting airspeeds.
- ***Power Plant.*** Engine limitations.
- ***Equipment & Systems.*** Limitations for all the various equipment and systems installed in the aircraft.
- ***Aircrew.*** Details of the minimum number of Flight Crew required to operate the aircraft.

Aircraft Operating Information.
At least the following information must be made available:

- ***Loading.*** Including empty weight, aircraft's empty weight configuration, C of G and datum.
- ***Operating Procedures.*** Normal and emergency procedures.
- ***Handling information.*** Significant or unusual handling characteristics of the aircraft together with stall speeds.
- ***Performance.*** Information as to the aircraft's performance at various aircraft configurations and power settings.

AIRCRAFT FLIGHT MANUAL.

The aircraft's Flight Manual must always be available to the pilot.

Note: Depending on the type of aircraft, the Flight Manual may be published in the form of a Pilot's Operating Handbook.

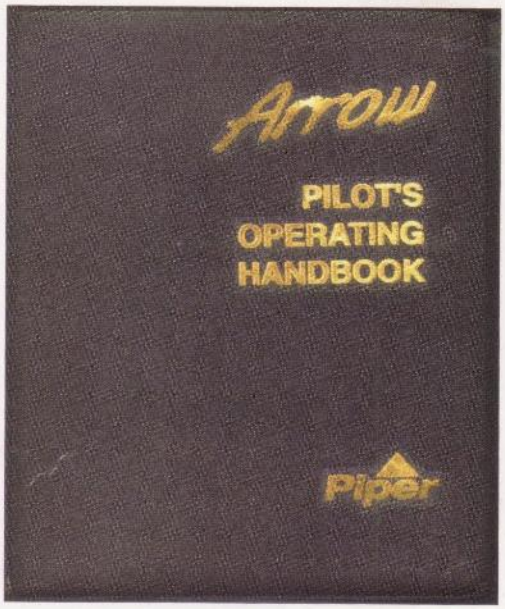


Figure 4.4 The Pilot's Operating Handbook.

MARKINGS AND PLACARDS.

Aircraft markings and placards (*See Figure 4.5*) should convey limitations, information and instructions for the attention of:

- Flight crew

  and

- ground crew who may be involved in, for example, servicing, re-fuelling or towing the aircraft.

Figure 4.5 Aircraft Placarding.

SERVICING AND MAINTENANCE OF AIRCRAFT.

The pilot should be aware that the servicing and maintenance of his aircraft must be carried out by a JAR 145 approved organisation.

The pilot must be aware that the servicing and maintenance of his aircraft must be carried out by a JAR 145 approved organisation.

Representative PPL - type questions to test your theoretical knowledge of ICAO Airworthiness.

1. Is the State of Registration responsible for the continuing airworthiness of the aircraft?

   a. No
   b. Yes at all times
   c. Only in the case of aircraft over 5 700 kgs
   d. Only when required to do so by ICAO

2. Where is the validity of a C of A specified?

   a. In the national AIP
   b. In the Aircraft Flight Manual
   c. In the Certificate of Registration (C of R)
   d. In the C of A itself

3. When an ICAO Contracting State issues an aircraft with a C of A, do other Contracting States have to recognise the C of A as valid?

   a. Only if the aircraft is flying outside ICAO airspace
   b. No
   c. Yes
   d. Only if it is flying within the airspace of the State of Registry

4. Information on aircraft placards is for:

   a. Flight crew only
   b. Ground crew only
   c. Flight crew, ground crew and the general public
   d. Both flight and ground crew

5. Safety and survival equipment must be:

   a. Kept under the passenger seats
   b. Inspected every week
   c. Easily identifiable
   d. Not be kept near aircraft emergency exits

6. In which document would you normally find the oil pressure limitations for your aircraft?

   a. Operation Manual
   b. Aircraft Placard
   c. The Flight Manual or Pilot's Operating Handbook
   d. The Technical Log

7. Which ICAO Annex concerns itself with Airworthiness?

a. Annex 8
b. Annex 9
c. Annex 6
d. Annex 7

8. What is the validity of the C of A?

a. 1 year
b. According to the Rules and Regulations of the State of Registry
c. According to the Rules and Regulations of ICAO
d. 6 months

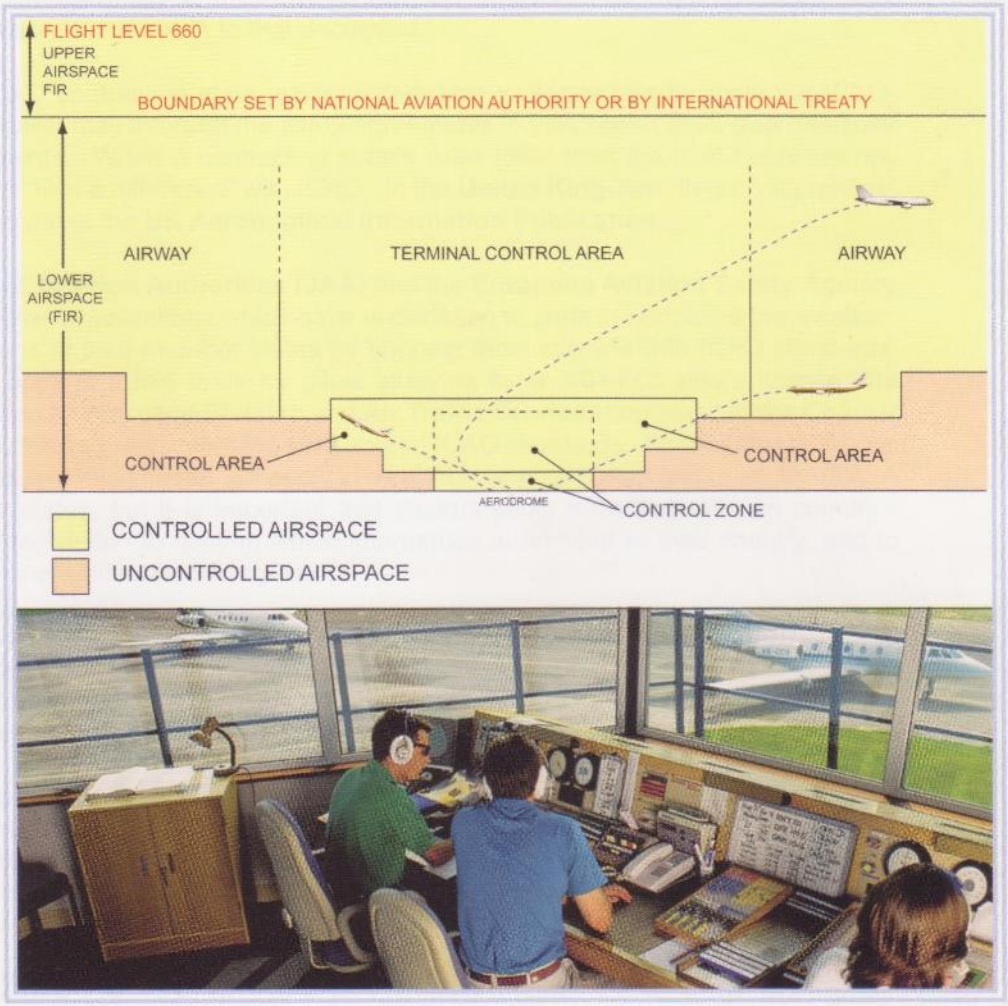
9. Which of the following is included in the C of A?

a. Empty weight C of G position
b. Aircraft Category
c. The Maximum Take-Off Mass
d. The name and address of the owner

Question	1	2	3	4	5	6	7	8	9
Answer									

The answers to these questions can be found at the end of this book.

CHAPTER 5
AIRSPACE DIVISION AND AIR TRAFFIC SERVICES (ICAO)



CLASSIFICATION OF AIRSPACE.

INTRODUCTION.

This Chapter deals with the **Division of Airspace** and **Air Traffic Services** as agreed internationally in the **'Convention on International Civil Aviation'**, and, most notably, in Annex 11 to that document.

Each ICAO contracting state, while undertaking to endeavour to apply the ICAO-agreed rules, may interpret the ICAO agreements in the context of its own particular requirements. When a contracting state's rules differ from the ICAO agreements, that state "files a difference" with ICAO. In the **United Kingdom**, these "differences" can be found in the **UK Aeronautical Information Publication.**

The **Joint Aviation Authorities (JAA)** and the **European Aviation Safety Agency (EASA)** are organisations which have undertaken to seek to normalise the aviation regulations of their member states by bringing them into line with ICAO standards. As this book is a text book for pilots studying for a JAR-FCL pilot's licence, the information on **Airspace Division** and **Air Traffic Services** contained in this Chapter deals exclusively with internationally agreed ICAO standards. For the most part, the information in this chapter will apply in all ICAO member states and in all JAA/EASA member states, but it is important that student pilots refer to their own country's aviation legislation to confirm which information is relevant to their country, and to identify where differences may exist.

Relevance of ICAO Standard Regulations to Pilots in the United Kingdom.

The United Kingdom (UK) has filed several differences with ICAO in respect of the **Division of Airspace** and **Air Traffic Services**. Those differences are covered in Chapter 13. **The information contained in this Chapter will be relevant to UK-based pilots and student pilots, except in those cases where differences are noted in Chapter 13. Among the UK differences are important differences for Visual Meteorological Conditions (VMC) minima in respect of low-speed aircraft operating at lower levels in some classes of airspace, and in some aspects of aerodrome air traffic services.**

THE NEED FOR AIRSPACE DIVISION.

Following the Second World War, civil aviation expanded rapidly throughout the world. With the advent of the jet engine, first used on military aircraft during the war years, the performance of airliners quickly surpassed that of wartime bombers and fighters, and so airliners began to fly **ever faster and higher**. At the same time, improvements in navigation and blind-flying instruments permitted commercial transport aircraft to **operate in all weathers**. As aircraft no longer depended solely on external references to manoeuvre and navigate, it was no longer safe for aircraft to fly on the **principle of "see and be seen"** in order to avoid conflict with other traffic.

Commercial passenger-carrying aircraft, especially, now required a radar-equipped **air traffic service** to ensure separation from other aircraft. Increasing traffic density, along with improving aircraft performance, meant that commercial aircraft, flying in accordance with **Instrument Flight Rules (IFR)**, required protection and separation while taking off and landing at aerodromes, during climb to, or descent from, en-route cruising levels, and during the en-route section of the flight itself.

As a result of these developments, and because of the global scale of air travel, the **International Civil Aviation Organisation (ICAO)** recommended the adoption of a world-wide system of **airspace division and classification**.

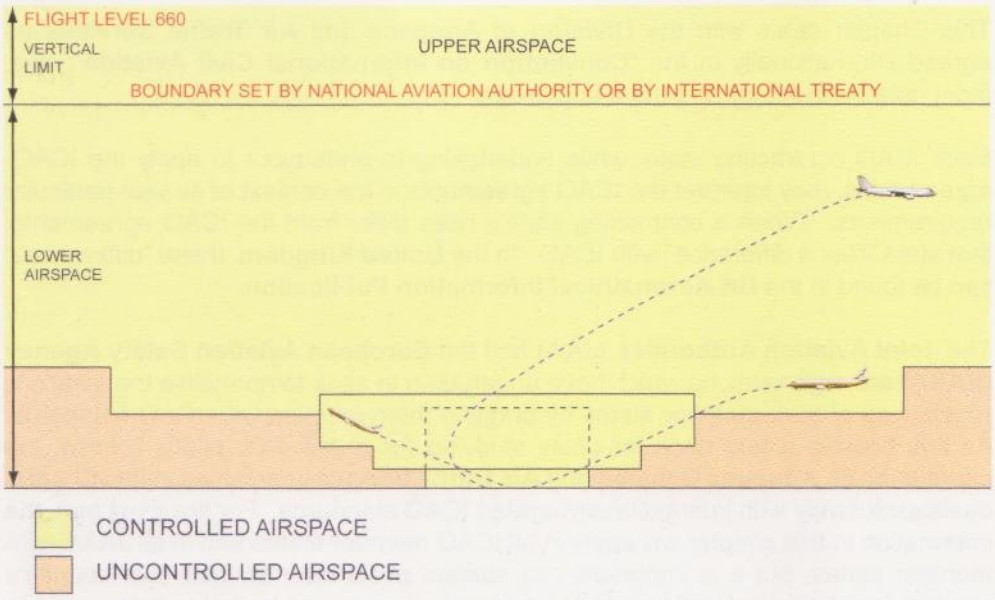


Figure 5.1 Airspace is divided into Controlled Airspace and Uncontrolled Airspace.

This system comprised two types of airspace: **controlled** and **uncontrolled** (*See Figure 5.1.*)

- **Controlled airspace**, entry into which required the aircraft to obtain a **clearance** from an **Air Traffic Control Unit (ATCU).** In **controlled airspace**, **ATCUs** regulated air traffic movements, and provided a **separation** service to aircraft flying **IFR**.

- **Uncontrolled airspace**, primarily for those aircraft flying in accordance with **Visual Flight Rules (VFR)** which could safely operate **without ATC constraints** being applied to their movements.

In the course of the years since World War II, the original **ICAO system of airspace division** has grown into the airspace classification system we have today, and which is enforced and administered around the world by the aviation authorities of all ICAO member states. This **ICAO airspace classification system** continues to evolve.

In the United Kingdom (UK), airspace classification is administered by the National Air Traffic Services. This chapter, however, deals with airspace classification as generally applied to all ICAO member states.

THE BASIC DIVISION OF AIRSPACE.

The division of airspace into **controlled** or **uncontrolled airspace** is made on the basis of criteria such as **air traffic density**, the **type of air traffic activity** (e.g. in airways, around aerodromes etc), and the **level of air traffic service** provided to pilots.

These criteria include:

- The requirement (or non-requirement) for an ATC clearance to aircraft to enter and operate in airspace under certain conditions contained within the clearance.
- The requirement (or non-requirement) for aircraft to operate under the control of an Air Traffic Control Unit (ATCU), and for separation between aircraft to be provided by an ATCU.
- The type of flight rules, VFR or IFR, permitted within the airspace.
- The requirement for a radio watch to be maintained by the pilot.
- The level of flight information given to an aircraft by an ATCU on the position and intentions of other aircraft sharing the same airspace.

In the ICAO system, the world's airspace is divided up into nine regions - the United Kingdom is part of the European and Mediterranean region - each of which is sub-divided into **Flight Information Regions (FIRs)** established from the surface up to flight levels set by national aviation authorities and applied by international treaty, and **Upper Information Regions (UIR)** above those levels. All airspace, **controlled** or **uncontrolled**, is contained within **FIRs**.

FLIGHT INFORMATION REGIONS.

A Flight Information Region (FIR) is airspace with specific dimensions, throughout which a **Flight Information Service** and **Alerting Service** are provided by **Air Traffic Service Units (ATSUs)**, as a minimum level of **air traffic service**. All airspace, throughout the world, belongs to some specified **FIR**.

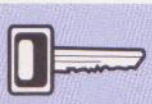
Oceanic airspace is divided into **Oceanic Information Regions**. The administration of **Oceanic Information Regions (OIR)** is undertaken, by international agreement with ICAO, by a national controlling authority bordering an **OIR**.

Figure 5.2 depicts **FIRs** in Europe and part of North Africa, as well as the Shanwick Oceanic Control Area.

Figure 5.2 All Airspace belongs to some specified Flight Information Region (FIR). Oceanic Airspace is divided into Oceanic Information Regions.

The subdivision of airspace throughout which a Flight Information Service and Alerting Service are provided is the Flight Information Region.

FIRs around the world are of varying dimensions as decided by the responsible **national aviation authority**. **FIRs** are divided into upper and lower regions above and below a given Flight Level. It is the lower region **(Lower Airspace)** which retains the designation **FIR** while the upper portion **(Upper Airspace)** is called an **Upper Information Region (UIR)**.



The boundary between the FIR and the UIR in a particular State is set by that State's national aviation authority.

The top of the **FIR** and base of the **UIR** is set by the **national aviation authority**. In the United Kingdom, the boundary between the **FIR** and the **UIR** is currently at Flight Level 245. In Germany, the boundary is Flight Level 285. European Union member states are currently discussing the creation of a "Single European Sky" with a European Upper Information Region which will presumably have a common lower boundary over all participating countries.

Currently, by international agreement, the **upper limit of controlled airspace** is at **Flight Level 660**.

Air Traffic Control Centres.

Each **FIR/UIR** is under the responsibility of an **Air Traffic Control Centre (ATCC)**. The two **UK FIRs, London** and **Scottish**, are controlled and administered by **National Air Traffic Services** from the **London Air Traffic Control Centre (LATCC** - pronounced Lat-sea) and the **Scottish Air Traffic Control Centre (SCATCC)**. Traffic in the **London FIR** which is not under the control of an aerodrome is controlled from **LATCC**, while similar traffic in the **Scottish FIR** is controlled from **SCATCC**. **Area Control Centres** (*See Page 102*) are often co-located with **ATCCs**.

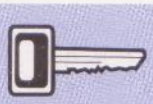
Around the frontiers of the United Kingdom, there are other **European FIRs** controlled by **ATCCs** located in the cities shown in *Figure 5.2*. Within the context of plans for a Single European Sky, the European Union hopes that European airspace will eventually have fewer **FIR** boundaries and a reduced number of **ATCCs**.

The **Upper Information Regions (UIR)** above the Brussels, Amsterdam and Hamburg **FIRs** are combined to form the Maastricht **UIR**, under the control of **Eurocontrol** at the **Maastricht ATCC**.

As aircraft on international flights cross **FIR** boundaries, they transfer their communications at each **FIR** boundary from one **ATCC** to the next.

Air Traffic Services Provided Within the Flight Information Region.

As we have established, a **Flight Information Region (FIR)** is divided into **controlled** and **uncontrolled** airspace.



FIRs provide a Flight Information Service and Alerting Service to all aircraft flying in the FIR.

Within the **FIR**, the basic level of **air traffic service** provided is the **Flight Information Service (FIS)** and the **Alerting Service**. These two services, together, provide information pertinent to the safe and efficient conduct of flights, and alert the relevant authorities if an aircraft suffers an emergency. A **Flight Information Service** and an **Alerting Service** are available to all aircraft flying within an **FIR**.

Within **controlled airspace**, in addition to a **Flight Information Service** and an **Alerting Service**, higher levels of **Air Traffic Advisory** and **Air Traffic Control (ATC)** services are available to suitably equipped aircraft manned by appropriately qualified pilots, and in accordance with the ICAO classification of that portion of airspace.

ATCCs provide air traffic services to aircraft flying in **controlled airspace** which are not under the control of **Air Traffic Service Units** located at aerodromes.

THE MAIN DIVISIONS OF AIRSPACE WITHIN FIRS.

Airspace, then, is divided, basically, into either **controlled** or **uncontrolled** airspace.

Looking again at *Figure 5.1*, we can now add some basic labels to the principal sub-divisions of **controlled** and **uncontrolled** airspace to give us the airspace picture in *Figure 5.3*. It is important that you should realise that **Figure 5.3** is only a representation of the division of **controlled airspace**. For instance, **Control Areas** may stretch well beyond a **Control Zone** laterally, and may even extend up to the ceiling of the **FIR**, protecting **IFR** traffic departing from and arriving at several aerodromes. (This is the case, for instance, of the **Daventry Control Area** in the **United Kingdom**.)

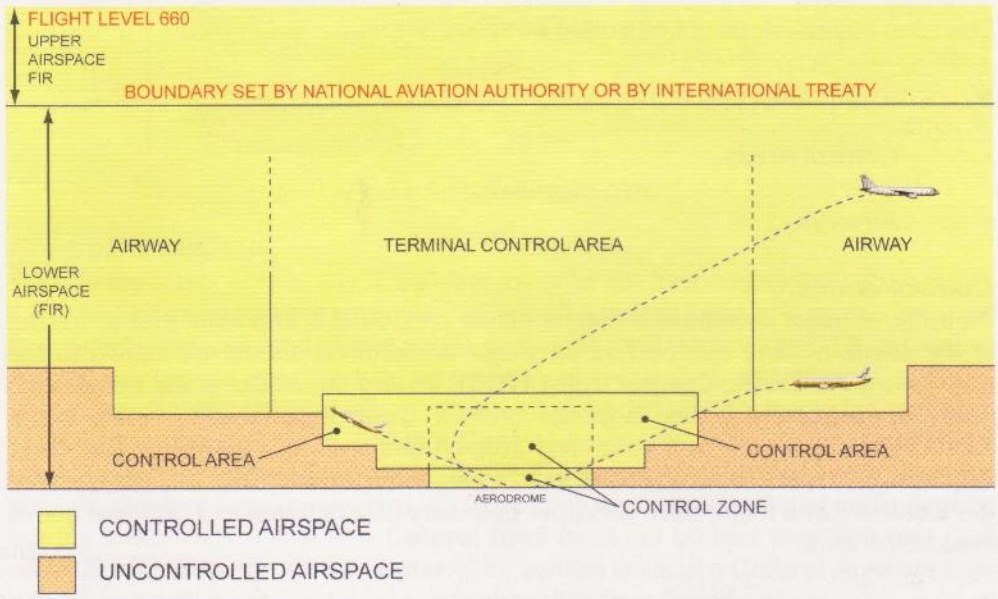


Figure 5.3 Basic Subdivisions of Controlled Airspace: Control Zone, Control Area, Terminal Control Area and Airway.

CONTROLLED AIRSPACE.

Access to **controlled airspace** is governed by **ATC** conditions which restrict entry to specified types of flight made by appropriately qualified pilots flying appropriately equipped aircraft, and (with certain exceptions) under the control of an **Air Traffic Control Unit (ATCU)**.

All aircraft flying in **controlled airspace** must, with rare exceptions, have received an **ATC clearance** to do so.

Flight in **controlled airspace** in accordance with the **Instrument Flight Rules (IFR)** requires the pilot to submit a formal **flight plan** which includes the aircraft's call sign and type, estimated time of departure, desired altitude, route and destination. The acceptance of the **flight plan** by an **ATCU** constitutes permission for the pilot to carry out his planned flight.

Generally, provided they have clearance from an **ATCU** to do so, pilots flying in accordance with the **Visual Flight Rules (VFR)** are also permitted to fly in **controlled airspace** other than **Class A airspace** (see Pages 90 to 91 for details of **airspace classification by letter**).

When in **controlled airspace**, **VFR** pilots must normally maintain radio contact with the responsible **ATCU**, and obey **ATC** instructions. However, **VFR** flight may only take place in **Visual Meteorological Conditions (VMC)** and, because air traffic rules apply differently to different **classifications of airspace**, the conditions of visibility and distance from cloud which constitute **VMC** are defined differently depending on what **type of controlled airspace** the **VFR** flight is operating in. Sometimes, in **uncontrolled airspace**, the definition of **VMC** differs between countries. This topic is covered in more detail, later in this chapter.

The main sub-divisions of **controlled airspace** are:

- **Control Zones.**
- **Control Areas.**
- **Airways.**

Control Zones.

A CTR extends from ground or water level to either a published altitude or a published flight level.

Air traffic at major aerodromes can be dense and, so, it is important that all aircraft in the circuit of, and approaches to, major aerodromes should be known to the responsible **Air Traffic Control Unit (ATCU),** usually the **ATCU** at the aerodrome, itself. Consequently, around large aerodromes, **Control Zones** of specified lateral dimensions are established, extending from ground level to a published altitude or Flight Level. There is no standard size or height for a **Control Zone**, but typically, the **Control Zone** might have an upper boundary of 2 500 feet to 4 000 feet above aerodrome level.

The lateral limits of a Control Zone must extend to at least 5 nm (9.3 km) from the centre of the aerodrome in the direction from which approaches are made.

The lateral limits of a **Control Zone** must extend to at least **5 nautical miles (9.3 kilometres)** from the centre of the aerodrome in the direction from which approaches may be made. If a **Control Zone** is located beneath a **Control Area**, the upper limit of the **Control Zone** must be, at least, the lower limit of the **Control Area**; though often the **Control Zone** will extend up into the **Control Area**.

VFR traffic may be permitted to enter or transit Class A Control Zones, but only with a Special VFR clearance.

Within the **Control Zone**, the responsible **ATCU** provides protection and separation to aircraft taking off from and landing at the aerodrome. Both **VFR** and **IFR** traffic require a **clearance** to enter a **Control Zone**. Quite often, notably in **Class A Control Zones**, **Instrument Flight Rules (IFR)** are permanently enforced at large aerodromes, although non-**IFR** traffic may be allowed to enter, leave and transit **Class A Control Zones** with a **Special VFR (SVFR) clearance**.

The abbreviation for **Control Zone** is **CTR**.

Figure 5.4 shows the **Luxembourg CTR**, as represented on an ICAO 1:500 000 scale aeronautical chart. The **Luxembourg CTR** extends upwards to 2500/feet.

Figure 5.4 Luxembourg CTR.

Control Areas.

Once in the climb, above, say, 2 500 feet, or while still descending through, say, 4 000 feet on an instrument approach, an aircraft does not need **ATC** protection down to **ground level**. So around and above and, often, well beyond the **CTR**, a **Control Area** is established specifically to protect aircraft in the climb and descent, and also aircraft which might be in a holding pattern awaiting clearance to begin the approach to land. It is important to realise that **Control Areas** are set up to encompass the airspace containing the flight paths of **IFR** flights requiring an **Air Traffic Control** service. **Control Area** dimensions will depend on local conditions and traffic density; but the lower vertical limit of a **Control Area** must not be less than **700 feet (200 metres) above the ground or water**. The vertical limits of a **Control Area** are from a published altitude or flight level to a higher altitude or flight level.

The vertical limits of a Control Area are from a published altitude or Flight Level to a higher altitude or Flight Level.

The lower vertical limit of a Control Area must not be less than 700 feet (200 metres) above the ground or water.

The abbreviation for **Control Area** is **CTA**. *Figure 5.5* shows part of the Brussels CTA situated above the Oostende CTR.

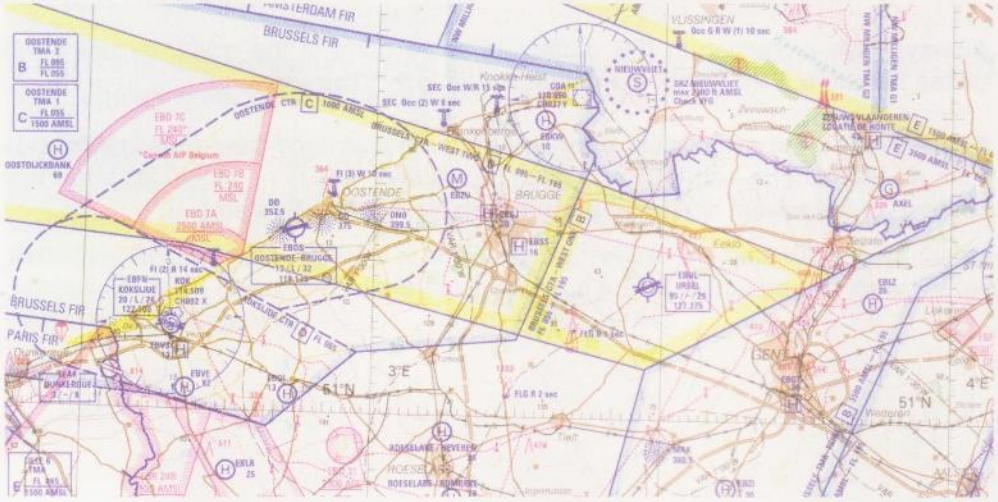


Figure 5.5 Part of the Brussels CTA over the Oostende CTR.

A Control Area at the confluence of several airways or controlled routes, and in the vicinity of one or more major aerodromes, is called a Terminal Control Area, abbreviated to TCA or TMA.

If a **CTA** located in the vicinity of one or more major aerodromes is also the junction of several airways, it may be classified a **Terminal Control Area (TCA)**. You should note that the abbreviation **TMA** is still used to designate a **Terminal Control Area.** This abbreviation is a relic of an earlier name, **Terminal Manoeuvring Area**. *Figure 5.6* depicts the **Eelde TMA** in the Netherlands.

Figure 5.6 The Eelde TMA.

The Airway.

An Airway is a **corridor of controlled airspace** which protects an air route linking major aerodromes, nationally and internationally. *Figure 5.7*, overleaf, depicts three **airways**: **A25**, **B39** and **G1 Airway B39**, over the United Kingdom, extending from **Flight Level 165** to the **upper boundary of the FIR (FL245)**. Notice that in the top left hand part of the diagram, the lower boundary of **Airway B39** steps up to a higher base of **FL215**.

Airways typically have a width of 10 nautical miles.

Airways, typically have a **width of 10 nautical miles** and may extend vertically from as low as a few thousand feet above the ground to the upper limit of the **FIR** bordering on the **Upper Information Region (UIRs)**. In **UIRs**, **airways** are called **Upper Air Routes**.

Airways give protection to **IFR** traffic. In some parts of the world, including the United Kingdom, **VFR** flights are not permitted to fly in **airways**.

Airways are often established so that they route over land-based navigation aids such as **VOR/DMEs** and **NDBs**, though, nowadays, this is no longer so important because of the advent of **Global Positioning Navigation Systems**.

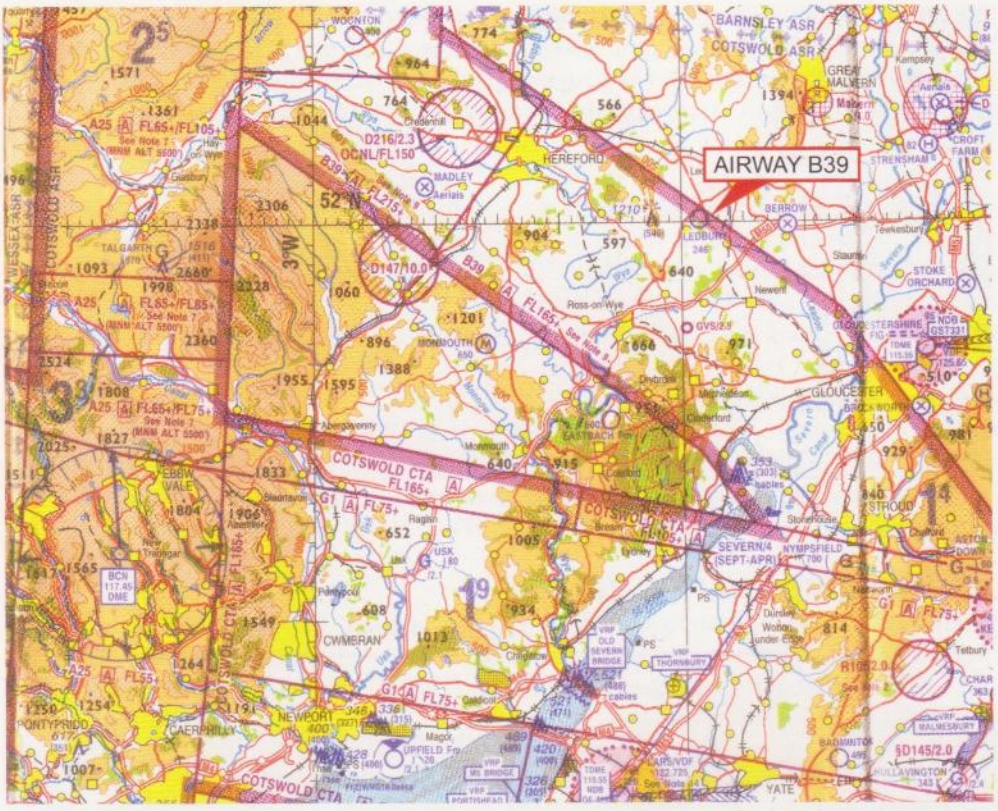


Figure 5.7 Airway B39, over the United Kingdom, extending upwards from Flight Level 165 (FL 165+), and then from FL215+.

UNCONTROLLED AIRSPACE.

In **uncontrolled airspace**, outside **CTRs**, **CTAs** and **Airways**, aircraft may normally operate **without any ATC clearance** or permission, and without having to be in contact with any **Air Traffic Service Unit**. However, aircraft flying in **uncontrolled airspace** must, at all times, comply with the **Rules of the Air** laid down by their **national aviation authority** and which will have been established in accordance with ICAO regulations.

There is a general **maximum speed limit of 250 knots** imposed on all IFR and VFR traffic operating below Flight Level 100 in uncontrolled airspace.

Air Traffic Control Units (ATCUs) do, however, provide certain services to flights in **uncontrolled airspace** under both the **Visual Flight Rules (VFR)** and the **Instrument Flight Rules (IFR)**. For example, **ATCUs** do notify the existence of **Advisory Routes** (*See Figure 5.8*) within **uncontrolled airspace**. These routes are not busy enough to warrant **Airway** status, but, if a pilot wishes to use them, he will be given an **ATC** service.

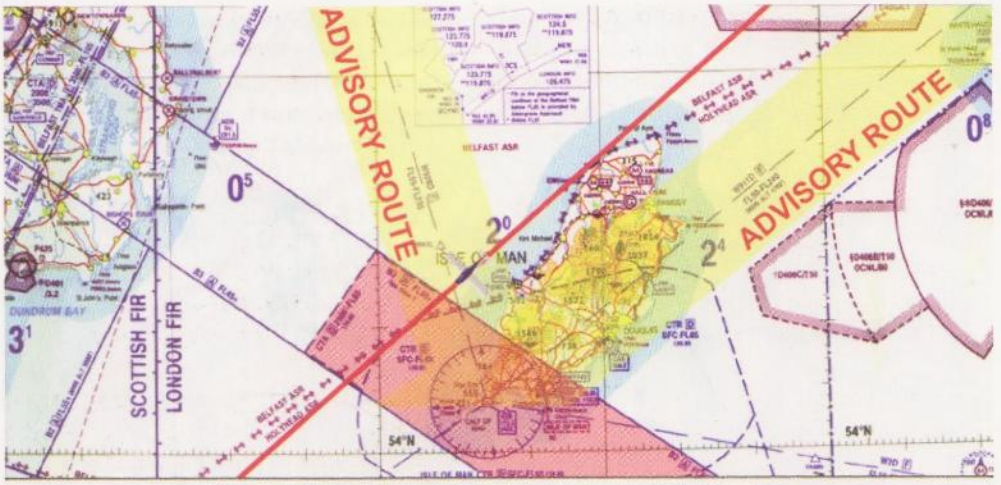


Figure 5.8 An Advisory Route in Uncontrolled Airspace.

AERODROME TRAFFIC ZONES.

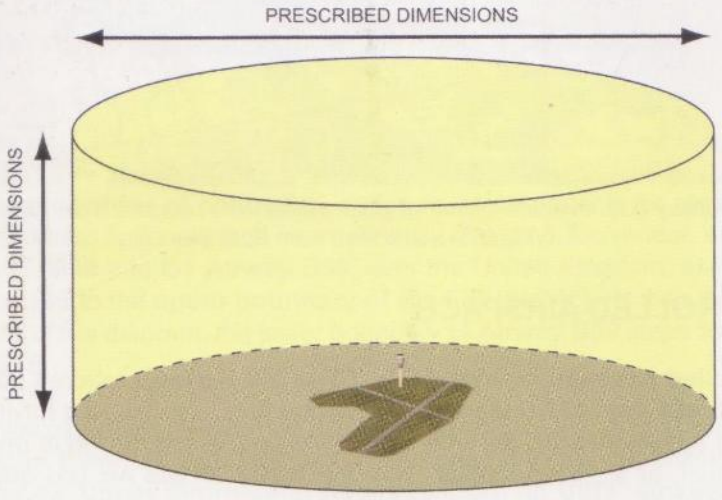


Figure 5.9 Aerodrome Traffic Zones of prescribed dimensions surround many aerodromes to protect traffic flying in the Aerodrome Circuit.

Aerodrome Traffic Zones (ATZs) are zones immediately surrounding aerodromes and airfields to protect traffic flying in the aerodrome circuit. **ATZs** surround many aerodromes located in both **controlled** and **uncontrolled** airspace.

ATZs are usually of defined lateral and vertical dimensions; for instance, in the United Kingdom, they extend to 2 000 feet above aerodrome level, and have a radius of either 2 nautical miles or 2.5 nautical miles, depending on the length of the longest runway. But ICAO, itself, does not specify what **ATZ** dimensions should be. ICAO simply lays down that an **ATZ** is an airspace of dimensions decided and notified by the **national aviation authority** and established by that authority, around an aerodrome, for the protection of aerodrome traffic. **ATZs** are not given any particular airspace classification; they take on the classification of the airspace within which they are established. Within **controlled airspace**, **ATZs** are usually found within **CTRs**, but are often not depicted on charts.

Rules are established by **national aviation authorities** governing the operation of aircraft within an **ATZ**. The hours of watch, radio frequencies and other details of the **ATZ** are normally contained in the **aeronautical information publications** of the state concerned. In the United Kingdom, such details are contained in the **ENR** Section of the **AIP**.

If an **ATZ** exists around an aerodrome in **uncontrolled airspace**, permission is, nevertheless, required to operate within it. An aircraft must not take off, land or operate within the **ATZ** unless the Pilot-in-Command of the aircraft has obtained the permission of the responsible **Air Traffic Service Unit (ATSU)** to do so, irrespective of whether that **ATSU** provides full Air Traffic Control, or a lower level of service.

Normally, regulations governing flight in an **ATZ** will, if you have a radio, require you to listen out on the appropriate frequency. More especially, when entering an **ATZ** a pilot must immediately report his height and position to the responsible **ATSU**. If your aircraft is not radio-equipped, you must normally consult the conditions prescribed by the aerodrome authority for the **ATZ**, before getting airborne, to obtain all the necessary permissions.

When entering an ATZ, a pilot must immediately report his height and position to the responsible ATSU.

In *Figure 5.10*, below, you can see several **ATZs** surrounding **London Heathrow CTR**. Elstree and Wycombe Air Park **ATZs** lie just outside the **CTR**, while Denham is actually inside the **CTR**, and White Waltham **ATZ** is partially inside the **CTR**.

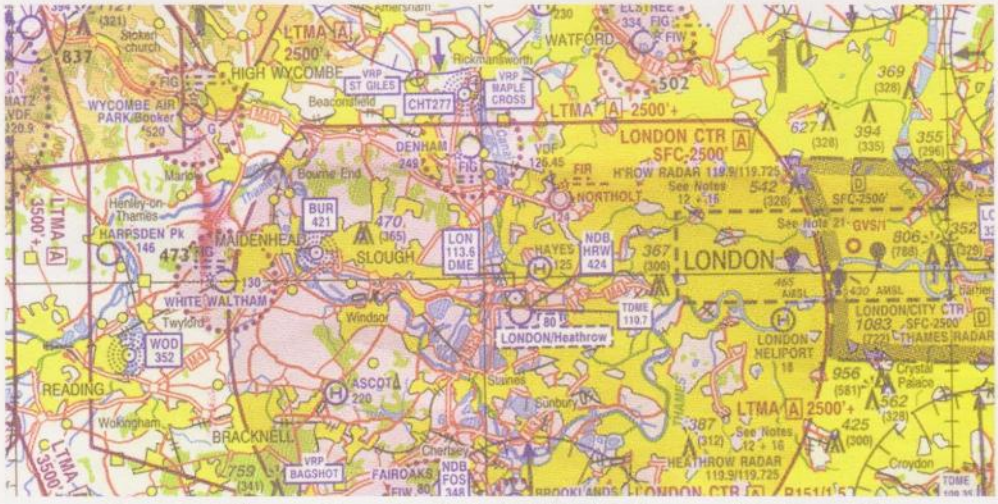


Figure 5.10 Elstree, Wycombe Air Park, White Waltham and Denham ATZs.

CLASSIFICATION OF AIRSPACE BY LETTER.

In 1990, ICAO adopted the current airspace classification scheme which identifies airspace, both **controlled** and **uncontrolled**, using the letters **A** to **G**.

The **controlled airspace** classes are: **A**, **B**, **C**, **D** and **E**.

The **uncontrolled airspace** classes are: **F** and **G**.

The **letter** allocated to each class of airspace **determines the type of air traffic control service** which **IFR** and **VFR** traffic receive in the airspace and the **rules which apply to that airspace**. The provisions which apply to each airspace class are given in the table, below.

CONTROLLED AIRSPACE
Class A All flights must be conducted under Instrument Flight Rules (IFR), unless flight under Special Visual Flight Rules (SVFR) is permitted. All flights are subject to ATC clearance, and all flights are separated from one another by ATC.
Class B Flights may be conducted under IFR, SVFR, or Visual Flight Rules (VFR). All aircraft are subject to ATC clearance. All flights are separated from one another by ATC.
Class C Operations may be conducted under IFR, SVFR, or VFR. All aircraft are subject to ATC clearance. Aircraft operating under IFR and SVFR are separated from one another and from flights operating under VFR. Flights operating under VFR are given traffic information in respect of other VFR flights.
Class D Operations may be conducted under IFR, SVFR, or VFR. All aircraft are subject to ATC clearance. Aircraft operating under IFR and SVFR are separated from one another, and are given traffic information in respect of VFR flights. Flights operating under VFR are given traffic information in respect of other VFR flights.
Class E Operations may be conducted under IFR, SVFR, or VFR. Aircraft operating under IFR and SVFR are separated from one another, and are subject to ATC clearance. Flights under VFR are not subject to ATC clearance. As far as is practical, traffic information is given to all flights in respect of VFR flights.
UNCONTROLLED AIRSPACE
Class F Operations may be conducted under IFR or VFR. ATC separation will be provided, so far as is practical, to aircraft operating under IFR. Traffic Information may be given as far as is practical in respect of other flights.
Class G Operations may be conducted under IFR or VFR. ATC separation is not provided. Traffic Information may be given, as far as is practical, in respect of other flights.

Each **national aviation authority** determines how it allocates the **ICAO letter classifications** to its **Control Zones (CTR)**, **Control Areas (CTA)** and **Airways**. Furthermore, not all letter classifications are used in **all** countries. For instance, in the United Kingdom, there is currently no **Class B** airspace. In France, there is currently no **Class B**, **C** or **F** airspace. In Germany, there is no **A** and **B airspace**, and in the Netherlands there is no **Class D airspace**.

For the United Kingdom, the classifications of airspace are covered in detail in the **UK AIP ENR 1-4**, and in **Chapter 13** of this book.

The Classification by Letter of Controlled Airspace.

Control Zones (CTRs) may be one of several classes of airspace. Heathrow **CTR** is **Class A** airspace. **London City** and **Birmingham CTRs**, like most UK **CTRs**, are designated **Class D** airspace.

In Germany, all **CTRs** are **Class C**.

In the Netherlands, most **CTRs** are **Class C**.

Amsterdam/Schiphol CTR is **Class C**, **Dusseldorf CTR** is **Class D**, **Oostende CTR** is **Class C**, **Merville CTR** is **Class E**. **Brussels CTR**, as depicted in *Figure 5.11*, is **Class C**.

Figure 5.11 Brussels CTR is Class C Airspace.

Control Areas (CTAs) and Terminal Control Areas (**TCA** or **TMA**) may be **Class A**, **B**, **C**, **D** or **E** airspace. **Most UK CTAs are Class D**.

The **CTA** above Heathrow, which is at the junction of several airways and bears the classification of **Terminal Control Area (TMA)**, is **Class A**. The **Lille TMA**, above the **Merville CTR** is **Class D** (*See Figure 5.12.*)

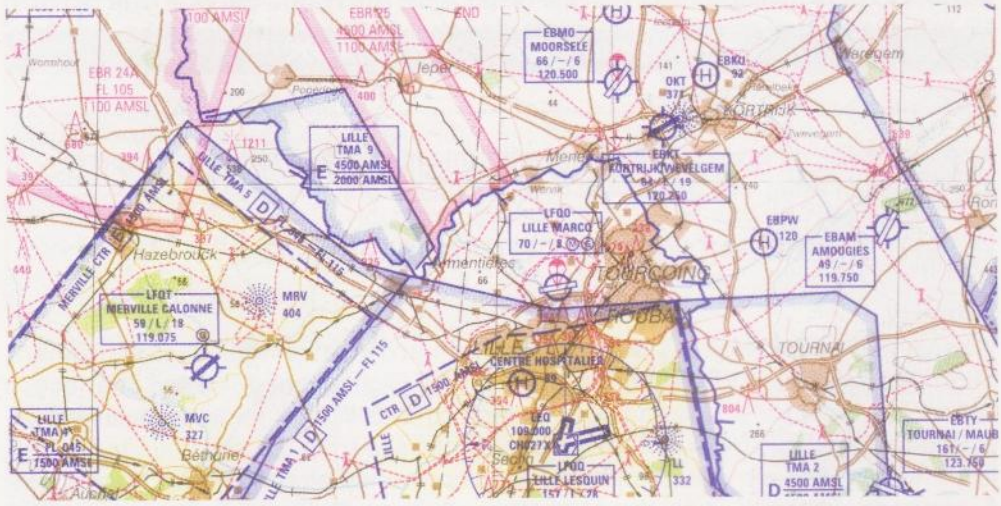


Figure 5.12 The Lille TMA is Class D. Merville CTR is Class E.

Airways can also belong to several airspace classification categories. For instance, in the **United Kingdom**, all **airways** are **Class A**, whereas in **Portugal**, **below Flight Level 245**, **airways are Class C**. **French airways** can be **Class E**, **up to Flight Level 115**, and then **Class D up to Flight Level 195**. **Irish airways** can be **Class C up to Flight Level 200**. (*See Figure 5.13.*)

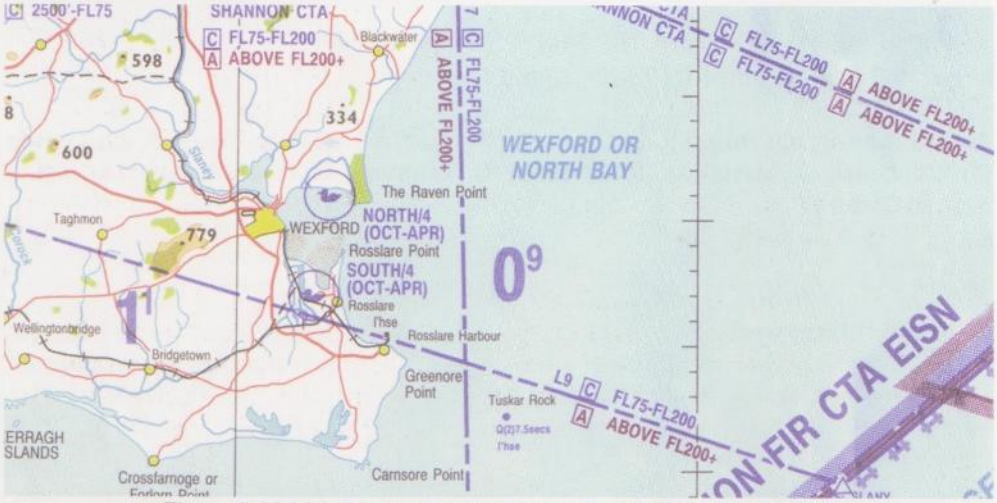


Figure 5.13 Irish Airways can be Class C up to Flight Level 200.

Upper Information Regions (UIRs) are invariably **controlled airspace**. In the United Kingdom, **UIRs** are **Class C** airspace.

The Classification by Letter of Uncontrolled Airspace.

Uncontrolled airspace is classified as **Class F** or **G**. **Class G** covers the vast majority of **uncontrolled airspace**, being the **Open FIR** where aircraft may operate without **ATC** clearances or constraints.

Advisory Routes (*See Figure 5.8 Page 88*) within **uncontrolled airspace** are designated **Class F**. In **Class F** airspace, flights in accordance with **IFR** will receive an **air traffic advisory service**. **VFR** flights will receive a **Flight Information Service**, if they request one. Pilots flying **VFR** in **Class F** airspace should, however, consider staying clear of the **advisory route** itself, and, if they wish to cross the **advisory route**, make contact with the responsible **Air Traffic Service Unit (ATSU)**, 10 minutes before crossing. On contacting the **ATSU**, pilots should be prepared to give position, level and the appropriate time information, as in a routine position report.

Airspace divisions and classifications are likely to continue to evolve, especially in the European Area, with the advent of the "Single European Sky."

FLIGHT RULES AND AIRSPACE CLASSIFICATION.

General.

Whenever they are airborne, aircraft must fly in accordance with either **Instrument Flight Rules (IFR)** or **Visual Flight Rules (VFR)**. Flight in **uncontrolled airspace** is not subject to air traffic clearances or control, so **VFR** flight is permitted everywhere in **uncontrolled airspace**. However, as you can see from the table at *Figure 5.14*, aircraft flying **VFR** are also permitted to fly in **controlled airspace other than Class A airspace**, although, **with the exception of Class E airspace**, they need **ATC** clearance to do so and, so, have to maintain radio contact with **ATC**.

Most Private Pilot Licence holders will be **VFR** pilots. **VFR** flight is flight based on the principle that the pilot is able to manoeuvre and navigate his aircraft, and, most importantly, be able to avoid conflict and collision with other aircraft, by visual reference to external features. More especially, when flying **VFR**, the pilot must be able to navigate his aircraft by reference to ground features. Consequently, in order that the **VFR** principle may be adhered to at all times, **VFR** flight may only take place in **Visual Meteorological Conditions (VMC)** which allow the pilot to maintain appropriate visual contact with the world outside his cockpit. However, because air traffic rules apply differently to different classifications of airspace, **VMC is also defined differently depending on the classification of airspace in which the VFR flight takes place**, and on the aircraft's vertical position. **VMC** is defined, then, depending on airspace classification, by prescribed minimum visual conditions which are referred to as **VMC minima**.

VFR flight may only take place in Visual Meteorological Conditions.

VMC Minima in the Different Classes of Airspace.

The **VMC minima** for the various classifications of airspace are shown in the following tables. These **VMC minima** may sometimes be defined slightly differently in different countries of the world. For instance, in the United Kingdom, **VMC** definitions cater for speed differences in some classes of airspace, below 3 000 feet AMSL; (*See Chapter 13*).

In order that a flight may be conducted in accordance with the Visual Flight Rules, the VMC minima must prevail which are appropriate to the Class of airspace in which the aircraft is flying and to its vertical position.

To make the logic of the **VMC minima** clearer, we have included in the tables details of **air traffic services** and **separation** provided, as well as **clearance requirements**.

VMC Minima in the Different Classes of Airspace.

CLASS A - Controlled Airspace		
	IFR	**VFR**
Separation provided	All aircraft	**VFR FLIGHT NOT PERMITTED.**
Service provided	Air traffic control service	
VMC minima	Not applicable	
Speed limitation	Not applicable	
Radio communication	Continuous two-way	
ATC clearance	Required	

CLASS B - Controlled Airspace		
	IFR	**VFR**
Separation provided	All aircraft	All aircraft
Service provided	Air traffic control service	Air traffic control service
VMC minima	Not applicable	**At and above FL 100** 8 km visibility Clear of cloud **Below FL 100** 5km visibility clear of cloud
Speed limitation	Not applicable	Not applicable
Radio communication	Continuous two-way	Continuous two-way
ATC clearance	Required	Required

CLASS C - Controlled Airspace		
	IFR	**VFR**
Separation provided	IFR from IFR IFR from VFR	VFR from IFR
Service provided	Air traffic control service	Air traffic control service for separation from IFR. VFR traffic information (and traffic avoidance advice on request)
VMC minima	Not applicable	**At and above FL 100** 8 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud **Below FL 100** 5 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud
Speed limitation	Not applicable	250 kt IAS below FL 100
Radio communication	Continuous two-way	Continuous two-way
ATC clearance	Required	Required

In Class D airspace, both VFR and IFR traffic are controlled. IFR flights are separated from each other and receive information regarding VFR flights. VFR traffic receives information regarding all other traffic.

CLASS D - Controlled Airspace		
	IFR	**VFR**
Separation provided	IFR from IFR	Not provided
Service provided	Air traffic control service including traffic information about VFR flights (and traffic avoidance advice on request)	Traffic information between VFR and IFR flights (and traffic avoidance advice on request)
VMC minima	Not applicable	**At and above FL 100** 8 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud **Below FL 100** 5 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud
Speed limitation	250 kt IAS below FL 100	250 kt IAS below FL 100
Radio communication	Continuous two-way	Continuous two-way
ATC clearance	Required	Required

CLASS E - Controlled Airspace		
	IFR	**VFR**
Separation provided	IFR from IFR	Not provided
Service provided	Air traffic control service and traffic information about VFR flights as far as practical	Traffic information as far as practical
VMC minima	Not applicable	8 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud
Speed limitation	250 kt IAS below FL 100	250 kt IAS below FL 100
Radio communication	Continuous two-way	Not required
ATC clearance	Required	Not required

CLASS F - Uncontrolled Airspace		
	IFR	**VFR**
Separation provided	IFR from IFR as far as practical	Not provided
Service provided	Air advisory control service Flight information service	Flight information service
VMC minima	Not applicable	**At and above FL 100** 8 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud **Below FL 100** 5 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud OR **At or below 900 m (3000 feet) AMSL or 300 m (1000 feet) above terrain, whichever is the higher** 5 km visibility Clear of cloud with surface in sight
Speed limitation	250 kt IAS below FL 100	250 kt IAS below FL 100
Radio communication	Continuous two-way	Not required
ATC clearance	Not required	Not required

CLASS G - Uncontrolled Airspace		
	IFR	**VFR**
Separation provided	Not provided	Not provided
Service provided	Flight information service	Flight information service
VMC minima	Not applicable	**At and above FL 100** 8 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud **Below FL 100** 5 km visibility 1500 m horizontal and 1000 feet vertical distance from cloud OR **At or below 900 m (3000 feet) AMSL or 300 m (1000 feet) above terrain, whichever is the higher** 5 km visibility Clear of cloud with surface in sight
Speed limitation	250 kt IAS below FL 100	250 kt IAS below FL 100
Radio communication	Continuous two-way	Not required
ATC clearance	Not required	Not required

Figure 5.14 VMC Minima for VFR flight in controlled and uncontrolled airspace.

The ICAO VMC minima in the various classes of airspace tabulated above are illustrated pictorially in *Figures 2.27* and *2.28* in *Chapter 2*.

Observations on VMC Minima.

Except for **Classes A** and **B** airspace, there is a general **speed limit of 250 knots** imposed on traffic operating **below Flight Level 100**. Not surprisingly then, **VMC minima,** in terms of flight visibility, are least for aircraft operating below **Flight Level 100**. Below **Flight Level 100**, the forward visibility minimum is reduced from 8 km to 5 km outside controlled airspace.

Below 3000 feet above mean sea-level, **or 1000 feet above the ground,** whichever is the higher, there is no prescribed vertical distance from cloud. Aircraft are simply required to be clear of cloud and in sight of the surface.

You should note that in **uncontrolled airspace**, **Classes F** and **G**, the United Kingdom has registered differences from the ICAO standard so as to allow greater flexibility to **VFR flights** at and below 3000 feet above mean sea-level. United Kingdom based pilots should refer to **Chapter 13** for **VMC minima below 3000 feet** when airspeeds are below 140 knots.

At higher altitudes, both in **uncontrolled airspace** and in **controlled airspace**, **VFR** pilots will be flying in airspace in which **IFR** flights flying at high speeds are being conducted. At these higher altitudes, **VFR** pilots must, naturally, continue to be able

to see and avoid other aircraft. Therefore, because of the possibility that an **IFR** flight, under the control of an **ATCU**, might emerge from a cloud, a **VFR** flight must remain at a prescribed distance from clouds, both vertically and laterally, and must maintain a minimum designated visibility sufficient to give the two aircraft time to spot and avoid each other.

Consequently, above **Flight Level 100** where the **250 knots speed limit** is not in force, in-flight visibility is required to be 8 km. However, below **Flight Level 100**, in **uncontrolled airspace**, and in **controlled airspace classified C**, **D** and **E**, **VMC** minima reduce again to 5 kilometres in-flight visibility, 1000 feet clear of cloud vertically and 1500 metres clear of cloud horizontally. This is because the 250 knots speed limit applies in this lower airspace.

If the actual weather minima give visibility and cloud cover below the minima specified for VMC, then IMC exists. If the actual minima are equal to, or in excess of, specified minima VMC exists.

You should note that in **controlled airspace** of **Class B**, where separation is provided by ATC to all flights, **VFR** as well as **IFR**, **VMC minima** are reduced at all flight levels. In **Class B** airspace, there is no prescribed minimum distance from clouds.

Instrument Flight Rules and Instrument Meteorological Conditions.

If **VMC** minima cannot be maintained, then **Instrument Meteorological Conditions (IMC)** prevail. In **IMC**, all flights must be conducted in accordance with **Instrument Flight Rules (IFR)**. **IFR** flight is more tightly regulated than **VFR** flight. In order to fly **IFR**, aircraft generally have to carry appropriate specialised instrumentation and pilots require to be appropriately qualified.

In IMC, all flight must be conducted in accordance with the Instrument Flight Rules (IFR).

AIR TRAFFIC SERVICES.

INTRODUCTION.

Before looking at **air traffic services**, themselves, we must give a definition of the two terms most commonly used when referring to the units and/or agencies which deliver the various levels of **air traffic service**. The two terms are: **Air Traffic Control Unit** and **Air Traffic Services Unit**.

Air Traffic Control Units.

Full air traffic control services are provided by **Air Traffic Control Units (ATCUs)**. An **ATCU** is a unit from which **instructions** (the **air traffic control service**), **advice** and **information** are given by radio to aircraft in the interests of safety.

An Air Traffic Control Unit (ATCU) *refers to a unit providing a full air traffic control service.*

Figure 5.15 An Air Traffic Control Unit.

All **ATCUs**, in addition to an **air traffic control service**, provide a **Flight Information Service** and an **Alerting Service** to aircraft under their jurisdiction.

The provision of an **Air Traffic Control Service** normally takes precedence over the provision of a **Flight Information Service**.

The term **Air Traffic Service Unit (ATSU)** *applies to a unit providing any level of air traffic control service.*

Air Traffic Service Units.

The term **Air Traffic Service Unit (ATSU)** is the most general of the terms applied to units providing **air traffic services**. The term **ATSU** may refer to an **ATCU** providing full **Air Traffic Control**, or to a unit not providing full **Air Traffic Control** but providing a **Flight Information Service,** (*See Page 102*) or a basic aerodrome **Air/Ground Communications Service,** (*See Page 104*).

AIR TRAFFIC SERVICES.

Air Traffic Services is a general expression applied to several categories of agency which, depending on the level of service, provide **control**, **advice, information** and **assistance** to aircraft.

The prime objective of **Air Traffic Services** as defined in **ANNEX 11** to the **Convention On International Civil Aviation** is to prevent collisions between aircraft, whether taxiing on the manoeuvring area of an aerodrome, taking off, landing, flying en-route, or flying in the holding pattern at an aerodrome.

Air Traffic Services also have as their aim:

- the **expediting** and **maintaining of an orderly flow of air traffic**.
- **the provision of advice** and **information** for the **safe and efficient conduct of flights.**
- **the provision of an alerting service** for aircraft in distress.

The three types of Air Traffic Service are:

- *Air Traffic Control Service.*
- *Flight Information Service.*
- *Alerting Service.*

Air Traffic Services are provided through one or more of the following:

- **A full Air Traffic Control Service.**
- **A Flight Information Service.**
- **An Alerting Service.**

FULL AIR TRAFFIC CONTROL SERVICE.

A full **air traffic control service** is provided by an **Air Traffic Control Unit (ATCU)**. An **ATCU** provides instructions, advice and information to aircraft, by radio, for the purposes of:

- preventing collisions between aircraft in the air.
- assisting in preventing collisions between aircraft moving on the apron and the manoeuvring area of an aerodrome.

- assisting in preventing collisions between aircraft and obstructions on the manoeuvring area.

- expediting and maintaining an orderly flow of air traffic.

The exact nature of the full **air traffic control service** depends on the particular circumstances of the aircraft which is receiving the service and on the class of airspace in which the service is provided. A full **air traffic control service** may comprise one or more of the following:

- An **Aerodrome Control Service**.

- An **Approach Control Service**, with or without the aid of radar.

- An **Area Control Service**, with or without the aid of radar.

Aerodrome Control Service.
An **Aerodrome Control Service** provided by an **ATCU** consists of:

- The **Aerodrome Control Service**, itself.

- A **Flight Information Service**.

- An **Alerting Service**.

The **Aerodrome Control Service** provided by an **ATCU** is, principally, a service to:

- Aircraft flying with visual reference to the surface in, and in the vicinity of, the **Aerodrome Traffic Zone (ATZ)**, whether or not the **ATZ** is situated within a **Control Zone (CTR)**.

- Aircraft operating on the manoeuvring area.

Figure 5.16 Aerodrome Control Service.

A controller providing an **Aerodrome Control Service** is responsible for issuing information and instructions to aircraft under his control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between:

- aircraft flying in, and in the vicinity of, the **ATZ**.
- aircraft taking off and landing.
- aircraft moving on the apron.
- aircraft and vehicles, obstructions and other aircraft on the manoeuvring area.

Aerodrome Control may be divided into **air control** and **ground movement control**.

The Air Controller provides services for aircraft flying in, and in the vicinity of, the **ATZ** and for aircraft taking off and landing and has absolute authority over all movements on active runways and their access points.

The Ground Movement Controller provides services for aircraft moving on the apron and aircraft and vehicles, on the manoeuvring area, except on active runways and their access points.

Aerodrome Control is also responsible, among other matters, for

- Alerting the safety services.
- Disseminating pertinent information on IFR, Special VFR and VFR traffic including departures.
- Disseminating appropriate items of essential aerodrome information.

The full air traffic service provided for all arriving and departing flights is called an **Approach Control Service**.

An **ATCU** providing an **Aerodrome Control Service** uses the call-sign **"Tower"** or **"Ground"** as appropriate.

Approach Control Service.

An **Approach Control Unit** provides:

- an **Approach Control Service** with or without the aid of radar.
- a Flight Information Service.
- an Alerting Service.

An **Approach Control Unit** may be combined with an **Aerodrome Control Unit**.

Figure 5.17 Approach Control Unit.

Approach Control Services Within Controlled Airspace.

An **ATCU** at an aerodrome within **controlled airspace** (Class A to E airspace) provides **approach control services** to aircraft, according to the classification of the airspace within which the aerodrome is located, from the time and location at which:

- arriving aircraft are released by **Area Control** until control is transferred to **Aerodrome Control**.
- aircraft approaching from outside **controlled airspace** place themselves under the control of **Approach Control** until control is transferred to **Aerodrome Control**.
- departing aircraft are taken over from **Aerodrome Control** until:
  - they are transferred to **Area Control**, or
  - they are clear of controlled airspace.
- over-flying aircraft are within the relevant controlled airspace.

Approach Control provides standard separation between **Special VFR** and **IFR** flights.

Approach Control Services Outside Controlled Airspace.

An **ATCU** at an aerodrome outside controlled airspace (Class F and G airspace) provides approach control services to aircraft, as determined by the aerodrome operator and as approved by the national authority, from the time and location at which:

- arriving aircraft place themselves under the control of **Approach Control** until control is transferred to **Aerodrome Control**.
- departing aircraft are taken over from **Aerodrome Control** until they no longer wish to receive a service, or are 10 minutes flying time away from the aerodrome, whichever is the sooner.

- overflying aircraft place themselves under the control of **Approach Control** until they are clear of the approach pattern, and either no longer wish to receive a service or are 10 minutes flying time away from the aerodrome, whichever is the sooner.

Aircraft within an **Aerodrome Traffic Zone (ATZ)** are required to comply with instructions from the **ATCU**. Flight in **uncontrolled airspace** (Class F and G), outside the **ATZ** is permitted without an Air Traffic Control clearance. However, controllers may assume that pilots of aircraft flying in the vicinity of the aerodrome in radio contact with the **ATCU** are complying with instructions unless the **ATCU** states otherwise.

An **ATCU** providing an **Approach Control Service** uses the call-sign **"Approach"** or **"Radar"** as appropriate.

Area Control Service.

Area Control Centres (ACC) are established in **Flight Information Regions** to provide an **Area Control Service** in the airspace under its jurisdiction.

Figure 5.18 Area Control Centre.

An **Area Control Service** comprises radar and non-radar air traffic services in airspace which is not under the jurisdiction of an **Approach** or **Aerodrome Control Unit**.

An **ACC** providing an **Area Control Service** normally uses the call-sign **"Control"** or **"Radar"** as appropriate.

FLIGHT INFORMATION SERVICE.

A Flight Information Service is provided to all aircraft flying in uncontrolled airspace, for the purpose of promoting the safe, orderly and efficient conduct of flights.

A **Flight Information Service** is a basic form of air traffic service available to any aircraft within a **Flight Information Region**.

A **Flight Information Service (FIS)** is a non-radar service provided, either separately or in conjunction with other services, for the purposes of supplying information useful for the safe and efficient conduct of flights. The **FIS** is probably the **air traffic service** most frequently used by VFR pilots flying in **uncontrolled airspace** (sometimes known as the **Open FIR.**)

An **FIS** includes information about:

- weather.
- changes of serviceability of facilities.
- conditions at aerodromes.
- any other information pertinent to flight safety.

An **FIS** is a very useful service for general aviation pilots flying VFR. Even if no particular information is desired by the pilot, it may be prudent for him to ask for an **FIS** when one is available. In that way, if a distress or urgency situation were to arise, the pilot is at least in contact with an **ATSU** which knows that he is airborne and what his route is.

There are numerous factors which limit the **air traffic service** given to a pilot receiving an **FIS**. For instance, because aerodromes and centres providing an **FIS** need only be equipped to a specified minimum level, accurate assessment of the possibility of collision hazard between aircraft in flight is very low.

Pilots should, therefore, recognise that no form of positive control or separation service can be provided to pilots receiving an **FIS**. It is of supreme importance that pilots understand that, while receiving an **FIS**, they are not under **air traffic control** and are, themselves, responsible for collision avoidance.

Receiving an **FIS** does not relieve the Pilot-in-Command of any responsibility as aircraft commander.

An **ATSU** providing a **Flight Information Service** uses the call-sign **"Information"** after the ground station identifier.

When you contact an **ATSU** to request a **Flight Information Service**, your transmission will take the form:

"Stephenville Approach, G-ABCD, Request Flight Information Service".

The Controller will reply "G-ABCD, Stephenville Approach, Go Ahead".

Your response, as a pilot, to the instruction **"Go Ahead"** will be to pass a standard report combining details of your **aircraft type**, **route information**, **position**, **altitude**, **flight rules** and **intentions**. A typical pilot response to the "**Go Ahead**" instruction would be:

"G-ABCD, PA-28, from Rissington Parva to Georgetown, 15 miles East of Stephenville, 2500 feet, QNH 987, VFR, estimate Wicken 46."

You will notice that details are passed to the **FIS Controller** in the following order:

1. Aircraft call-sign.
2. Aircraft Type.
3. Route or operation information.
4. Position.
5. Altitude.
6. Altimeter setting.
7. Flight rules (VFR or IFR).
8. Estimate of time at next waypoint.

Passing your details in this standard format will help the **FIS** controller to visualise your situation, and, thus, to give you a better service.

Note that, in the United Kingdom, when a pilot requests an **FIS**, the controller's response is **"Pass Your Message"** rather than the standard ICAO response of **"Go Ahead"**.

Flight Information Service at Aerodromes.

Where a full **Air Traffic Control Service** is not established at an aerodrome, the aerodrome may provide an **Aerodrome Flight Information Service** (**AFIS**) in order to give information useful for the safe and efficient conduct of flights in the **Aerodrome Traffic Zone (ATZ)**.

When receiving an **AFIS** from an aerodrome, it is the responsibility of the Pilot-in-Command to decide the appropriate course of action to be taken to ensure the safe conduct of his flight and the safety of his aircraft when taking off, landing or flying in the **ATZ**.

An **AFIS**-provider will not issue instructions or clearances to pilots. A controller providing an **AFIS** passes information, only, to aircraft that are operating in the **ATZ** or about to enter the **ATZ**.

An aerodrome providing an **AFIS** will use the call sign "**Information**" after the aerodrome identifier.

Air/Ground Communication Service.

Where an aerodrome has neither a full **Air Traffic Control Service**, nor an **Aerodrome Flight Information Service**, for instance at airfields where only a flying club operates, an **Air/Ground Communications Service** may be available which will use the suffix **"Radio"** following the name of the airfield.

An **Air/Ground Communications** facility permits two way communication between an aircraft and a ground station in which the ground operator may pass only very basic information regarding the situation at the aerodrome.

Figure 5.19 An Air/Ground Radio Communications Service may pass only very basic information regarding the situation at the aerodrome.

ALERTING SERVICE.

An **Alerting Service** is provided by **ATSUs** to notify appropriate organisations regarding aircraft in need of search and rescue aid, and to assist such organisations as required.

Air traffic services provide an **Alerting Service** for all known aircraft operating within a **Flight Information Region (FIR)**.

The responsibility for initiating action in respect of an aircraft which is experiencing an emergency is normally that of the **ATSU** which was last in communication with the aircraft.

Collation of information.

Flight Information Centres (FICs) and **Area Control Centres (ACCs)** are the organisations which are responsible for the collation of all information relevant to a state of emergency being experienced by an aircraft within the **FIR**. These centres then forward the information to the **Rescue Coordination Centre (RCC)**.

Rescue Coordination Centre.

Each State is accountable for establishing a **Rescue Coordination Centre (RCC) within its territory**. The **RCC** is responsible for the coordination of all search and rescue **(SAR)** operations concerned with aircraft known, or believed, to be in need of help. It is the **RCC** which will coordinate any specialist effort such as mountain rescue teams or diving/helicopter organisations etc.

The RCC is responsible for all SAR operations within a state.

Aircraft Under the Control of Aerodrome or Approach Service.

If an aircraft is experiencing a state of emergency while under the control of **Aerodrome** or **Approach Control Services**, the **ATCU Controller** is responsible for:

- Passing a flow of information and updates to the **FIC/ACC** for forwarding to the **RCC**.
- Setting in motion all appropriate local rescue and emergency organisations which can give immediate assistance.

EMERGENCY PHASES.

The **Alerting Service** comprises 3 phases. These are the:

- **Uncertainty Phase**.
- **Alert Phase**.
- **Distress Phase**.

The Phases of Emergency:

1. Uncertainty Phase.

2. Alert Phase and

3. Distress Phase.

Uncertainty Phase.

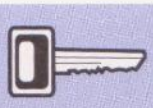
The Uncertainty Phase is declared when:

- There exists **uncertainty** as to the safety of an aircraft, for instance when no communication has been received from an aircraft within 30 minutes after the time a communication should have been received, or from the time an unsuccessful attempt to establish communications with an aircraft was first made, whichever is the earlier.

- An aircraft fails to arrive within 30 minutes of the Estimated Time of Arrival last notified to, or estimated by, an **ATSU**, whichever is the later.

Alert Phase.

The **Alert Phase** is declared when there exists **apprehension** about the safety of an aircraft and its occupants, and specifically when:



If an aircraft is subject to unlawful interference, the Alert Phase is declared.

- Following the **Uncertainty Phase**, subsequent attempts to establish communications with the aircraft, or inquiries to other sources, have failed to reveal any news of the aircraft.
- An aircraft has been cleared to land and fails to do so within 5 minutes of the estimated time of landing, and communications have not been re-established.
- Information has been received which indicates that the operational efficiency of the aircraft has been impaired, but not to the extent that a forced landing is likely, except when evidence exists as to the safety of the aircraft and its occupants.
- An aircraft is known, or believed, to be the subject of unlawful interference (hi-jack).

Distress Phase.

The **Distress Phase** is declared when there exists a **reasonable certainty** that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance, and specifically when:

- Following the **Alert Phase**, further unsuccessful attempts to establish communications with the aircraft, and more widespread inquires, point to the probability that the aircraft is in distress.
- The fuel on board is considered to be exhausted, or to be insufficient to enable the aircraft to reach safety.
- Information is received which indicates that the operating efficiency has been impaired to the extent that a forced landing is likely.
- Information is received confirming that, or it is reasonably certain that, the aircraft is about to make, or has made, a forced landing.

Termination of an Emergency.

When the emergency situation no longer exists, the local **ATSU**, via the **FIC** or **ACC**, shall inform the **RCC**. The **RCC** has the responsibly for terminating all **SAR** operations.

Representative PPL - type questions to test your theoretical knowledge of ICAO Airspace Division and Air Traffic Services.

1. You are a private pilot but hold neither an instrument rating nor an IMC rating. How would you enter a CTR which is Class A airspace?

   a. Complete a flight plan prior to departure
   b. Request a SVFR clearance to enter the Zone
   c. Call 10 minutes prior to CTR penetration
   d. You can enter the CTR as long as the conditions are VMC

2. In which class of airspace are both IFR and VFR flights permitted, all flights are provided with ATC, IFR flights are separated from other IFR flights and receive traffic information concerning VFR flights while VFR flights receive traffic information in respect of all other flights?

   a. Class B
   b. Class C
   c. Class D
   d. Class E

3. What is the Indicated Airspeed limit in Class C Airspace for VFR traffic?

   a. 120 kts TAS below 10 000 feet
   b. There is no specified speed limit
   c. 250 kts IAS below FL 100
   d. 120 kts

4. What airspace/s are considered "Controlled Airspace"?

   a. A only
   b. A, B, C and D only
   c. A, B, C, D and E only
   d, A, B, C, D, E and F only

5. What are the 3 types of Air Traffic Services?

   a. Air Traffic Control Service (ATCS), Flight Information Service (FIS) and the Alerting Service
   b. ATCS, FIS and Radar
   c. ATCS, Advisory Service and Alerting Service
   d. Alerting Service, Advisory Service and Radar

6. What is the definition of 'Alerting Service'?

   a. A service provided by the air traffic services which provides search and rescue facilities
   b. A service provided by the air traffic services in order to disseminate information about any aircraft in need of assistance
   c. A service provided by the air traffic services in order to notify appropriate organizations about aircraft in need of search and rescue aid, and to assist such organizations, as required
   d. A unit of the air traffic services established to coordinate search and rescue operations

7. An aircraft is known or believed to be the subject of Unlawful Interference (hi-jack). What phase of the Alerting Service should be declared?

   a. Emergency Phase
   b. Uncertainty Phase
   c. Alert Phase
   d. Distress Phase

8. An aircraft has been cleared to land and fails to do so within 5 minutes of the estimated time of landing, and communications have not been re-established. What phase of the Alerting Service should be declared?

   a. Emergency Phase
   b. Alert Phase
   c. Uncertainty Phase
   d. Distress Phase

9. Which organisation is responsible for the coordination of Search and Rescue efforts within a State?

   a. Flight Information Centre
   b. Air Traffic Control Centre
   c. Approach Control Centre
   d. Rescue Coordination Centre

10. To which of the following is the Alerting Service available?

    a. All aircraft in Class F airspace
    b. Any aircraft known to the air traffic services
    c. All aircraft in Class G airspace
    d. To all aircraft more than 15 minutes late at the destination airfield

11. No communication has been received from an aircraft within 30 minutes after the time a communication should have been received. What phase of the Alerting Service must be declared?

    a. Emergency Phase
    b. Uncertainty Phase
    c. Alert Phase
    d. Distress Phase

12. What is the standard width of an airway?

a. 10 nautical miles
b. 5 nautical miles
c. 8 nautical miles
d. 3 nautical miles

13. What is the boundary separating the Flight Information Region from the Upper Information Region?

a. The national aviation authority of the State concerned sets the boundary
b. FL250
c. 3000 feet
d. FL100

14. What is the difference between a Control Zone (CTR) and a Control Area (CTA)?

a. A CTR extends from a Flight Level (FL) to a FL whereas a CTA extends from an altitude to an altitude
b. A CTA extends from a FL to a FL whereas a CTR extends from an altitude to an altitude
c. A CTR extends from a FL to a FL whereas a CTA extends from the ground or water to an altitude
d. A CTR extends from the ground or water to an altitude or FL whereas a CTA extends from an altitude or FL to a higher altitude or FL

15. What meteorological conditions must prevail in order for a flight to take place in accordance with the Visual Flight Rules?

a. At least IMC
b. Clear of cloud and in sight of the surface
c. 5 km in-flight visibility, with 1500 metres horizontal and 1000 feet vertical separation from cloud
d. VMC appropriate to the Class of Airspace in which the aircraft is flying and appropriate to its vertical position

16. What minimum level of air traffic service is provided in a Flight Information Region?

a. A Flight Information Service and an Alerting Service
b. ATC and Flight Information Service
c. ATC and Advisory Service
d. Advisory and Alerting Services

17. Where is a TMA most likely to be found?

a. At the confluence of airways or controlled routes and in the vicinity of one or more major airports
b. In the vicinity of an International Airport
c. When special routes are required for arrivals and departures
d. In the vicinity of Controlled Aerodromes

18. Which class of airspace provides IFR flights with an Air Traffic Advisory Service and all flights with a Flight Information Service, if requested?

a. B
b. D
c. G
d. F

19. What may be the lowest point of the CTA according to ICAO regulations?

a. From any specified height above the ground or water
b. From a specified height above ground or water being not less than 700 feet
c. At least 1000 feet amsl
d. There is no such regulation

20. You are about to enter an Aerodrome Traffic Zone (ATZ) of an airfield at which you have received prior permission to land. Immediately upon entering the ATZ you must report your:

a. Height and magnetic heading
b. Height and position
c. Altitude and magnetic heading
d. Flight Rules and magnetic heading

21. What is the lowest level of a CTA permitted by international agreement?

a. Not lower than 700 feet above the surface of the ground or water
b. Not lower than 1000 feet above the surface of the ground or water
c. Not lower than 1500 feet above the surface of the ground or water
d. Not lower than 500 feet above the surface of the ground or water

22. What is the Class Airspace in which both VFR and IFR traffic is controlled and in which IFR and SVFR flights are separated from each other and receive information regarding VFR traffic, and in which VFR traffic receives information regarding all other traffic?

a. A
b. E
c. C
d. D

23. What action may a Pilot-in-Command elect to take if he judges that an ATC clearance does not suit his circumstances?

a. He should say nothing to the air traffic controller and proceed in the manner he judges to be most suitable to his circumstances
b. He may request an amended clearance
c. He must accept the ATC clearance without question
d. He must inform the air traffic controller of his intentions and then proceed as he judges to be most suitable to his circumstances

24. What are the lateral dimensions of a Control Zone?

a. 10 nautical miles in the direction from which approaches are made, measured from the centre of the aerodrome or, where more than one aerodrome is covered, 10 nautical miles from the centre of the combined aerodromes in the direction from which approaches are made
b. 5 nautical miles in the direction from which approaches are made, measured from the centre of the aerodrome or, where more than one aerodrome is covered, 10 nautical miles from the centre of the combined aerodromes in the direction from which approaches are made
c. 5 kilometres in the direction from which approaches are made, measured from the centre of the aerodrome or, where more than one aerodrome is covered, 5 kilometres from the centre of the combined aerodromes in the direction from which approaches are made
d. 5 nautical miles in the direction from which approaches are made, measured from the centre of the aerodrome or, where more than one aerodrome is covered, 5 nautical miles from the centre of the combined aerodromes in the direction from which approaches are made

25. A service provided by an Air Traffic Control Unit for all controlled flights arriving at or departing from an aerodrome is called:

a. An Area Control Service
b. An Approach Control Service
c. A Flight Information Service
d. An Alerting Service

26. If the actual or forecast conditions give the visibility and cloud base as less than specified minimum weather conditions and the distance from cloud is seen also to be less than specified minima, the prevailing weather conditions are referred to as:

a. VMC
b. IMC
c. VFR
d. IFR

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer												

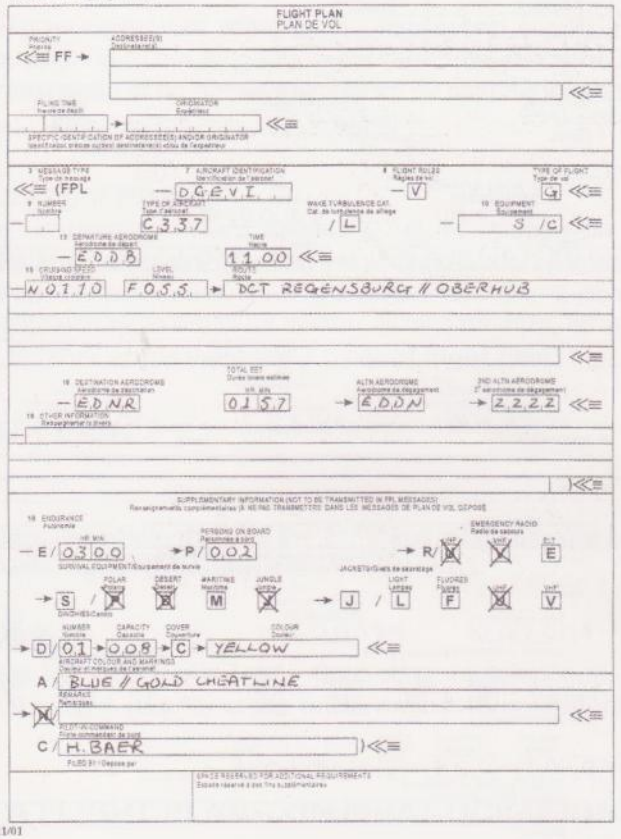
Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer												

Question	25	26
Answer		

The answers to these questions can be found at the end of this book.

CHAPTER 6
FLIGHT PLANS AND CLEARANCES (ICAO)

1. ICAO model flight plan form



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1. ICAO model flight plan form

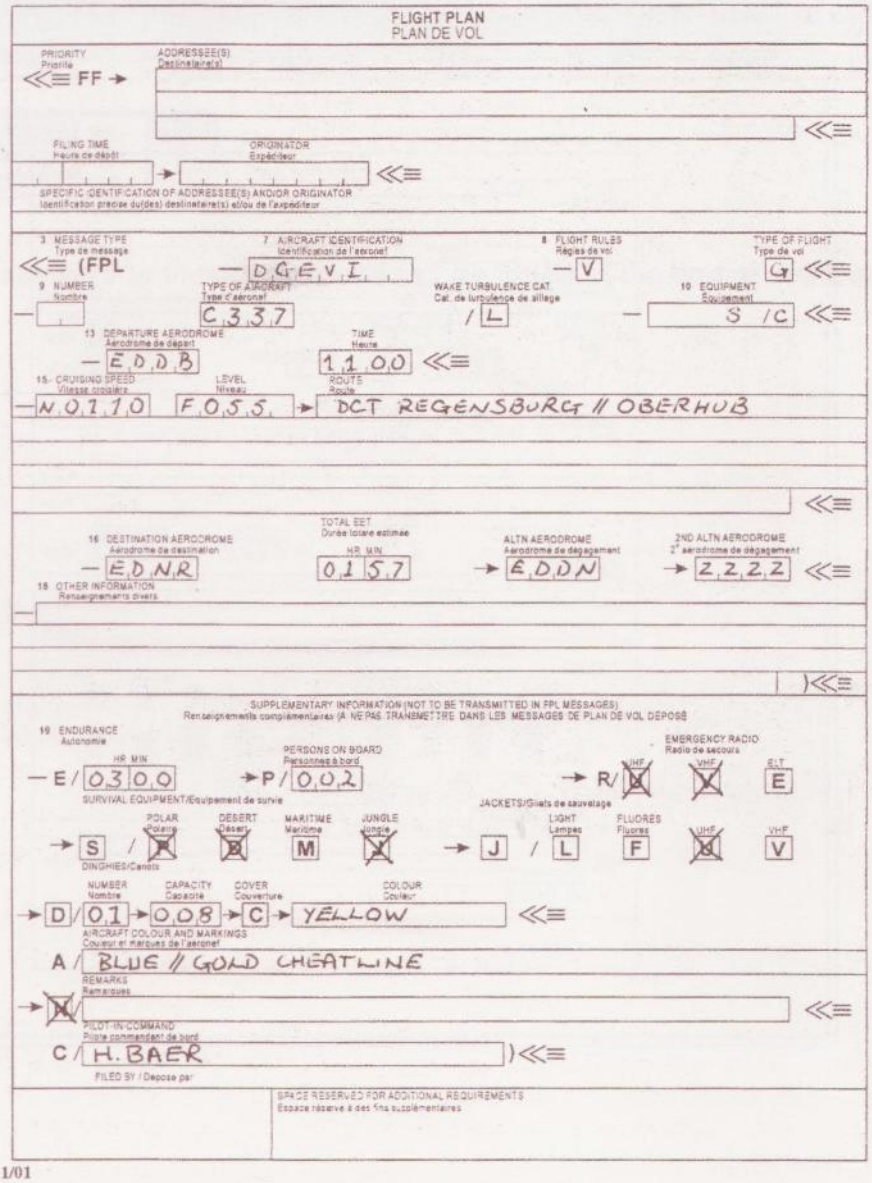

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Fig 6.1 ICAO Flight Plan Form.

GENERAL.

Flight Plans are a method of informing Air Traffic Services (ATS) of the details of a pilot's aircraft and proposed route. When necessary, **a flight plan** is also submitted when an ATS clearance is required.

- **Flight Plans** can be written and filed on a standard ICAO Flight Plan Form. (*See Figure 6.1.*)

- The form should be completed using capital letters and should include an English text, in addition to the language(s) of the State concerned. A **flight plan** can be transmitted in an abbreviated form, by telephone, and, in flight, over the radio.

If the aerodrome of departure does not have a ATS reporting office, you must submit your flight plan by telephone or radio to the ATSU serving the departure aerodrome.

ICAO Definition of a Flight Plan.

The term "**flight plan**" is used to mean, variously, full information on all items comprised in the **flight plan** description, covering the whole route of a flight, or limited information required when the purpose of the **flight plan** is to obtain a clearance for a minor portion of a flight such as to cross an airway, to take off from, or to land at a controlled aerodrome. In other words there are 2 types of **flight plan**.

TYPES OF FLIGHT PLAN.

Full Flight Plan.

In this type of **flight plan**, the whole route of the flight and all details are completed following the format of the Flight Plan Form. *(See Figure 6.1.)*

Abbreviated Flight Plan.

This is normally passed by radio to Air Traffic Control, or by telephone, to obtain a clearance for part of a flight (e.g. to cross an airway or to enter controlled air space).

SUBMISSION OF A FLIGHT PLAN – ON WHAT OCCASIONS?

A **flight plan** is to be submitted, before departure of the flight, to an Air Traffic Services Reporting Office or, during flight, to the relevant Air Traffic Services Unit (ATSU).

A flight plan is to be submitted, prior to operating the following types of flight:

- Any flight or part of a flight which is to be provided with an Air Traffic Control Service.

- Any IFR flight within Advisory Airspace (Class F).

- Any flight within or into designated areas, when so required by the Air Traffic Services authority in order to facilitate the provision of:

  a. A Flight Information Service.

  b. An Alerting Service.

  c. A Search and Rescue Service.

- Any flight within or into designated areas, when so required by the Air Traffic Services (ATS) authority, in order to facilitate co-ordination with military units or with ATSs in adjacent States in order to avoid the possible need for interception.

- Any flight across international borders.

SUBMISSION OF FLIGHT PLANS – TIME LIMITATIONS.

Unless otherwise prescribed by the ATS authority, a **flight plan** for a flight to be provided with an ATC service or an Air Advisory Service shall be submitted:

- On the ground to an ATS Reporting Office, **at least 60 minutes before departure**

or

- In flight, to the appropriate Air Traffic Services Unit (ATSU) at a time which will ensure its receipt by the ATSU and at least **10 minutes before the aircraft is estimated to reach:**

  A. The intended point of entry into a Control Area or Advisory Area

  or

  B. the point of crossing an airway or Advisory Route (ADR).

Note: Having submitted a **flight plan**, all aircraft must wait for a responding ATC Clearance before proceeding on course.

DELAY ON DEPARTURE.

In the event of a delay to an uncontrolled flight of 60 minutes in excess of EOBT, the flight plan should be amended or a new Flight Plan submitted and the old Flight Plan cancelled.

In the event of a delay, in excess of Estimated Off-Blocks Time (EOBT), of 30 minutes for a Controlled Flight, and 60 minutes for an Uncontrolled Flight, the **flight plan** should be amended or a new **flight plan** should be submitted and the old **flight plan** cancelled.

CONTENTS OF A FLIGHT PLAN.

A Flight Plan shall comprise the following information:

- Aircraft identification.

- Flight rules and type of flight.

- Number and type(s) of aircraft and wake turbulence category.

- Equipment.

- Departure aerodrome.

- Estimated Off-Block Time (in the case of an airborne **flight plan** this relates to the time over the first point of the route to which the flight plan refers).
- Cruising speed(s).
- Cruising level(s).
- Route to be followed.
- Destination aerodrome and total estimated elapsed time.
- Alternate aerodrome(s).
- Fuel endurance.
- Total number of persons on board.
- Emergency and survival equipment.
- Other information.

CHANGES TO A FLIGHT PLAN.

All changes to a **flight plan** submitted for an IFR flight, or for a VFR flight operated as a controlled flight, shall be reported as soon as practicable to the appropriate Air Traffic Services Unit (ATSU).

Information submitted prior to departure regarding fuel endurance or total number of persons on board, if incorrect at time of departure, constitutes a significant change to the **flight plan** and, as such, must be reported.

ADHERENCE TO FLIGHT PLAN – CONTROLLED FLIGHTS.

Controlled flights must adhere to the current **flight plan** except in the event of an emergency situation, in which case the aircraft is to immediately inform the ATSU of the action being taken, or being authorised to divert from the **flight plan** by ATC.

Inadvertent Changes.

In the event that a flight inadvertently deviates from its current flight plan, the following action shall be taken:

- **Deviation from track:**
  Adjust the heading of the aircraft to regain track as soon as practicable.
- **Variation in true airspeed (TAS):**
  If the actual TAS at cruising level between reporting points varies, or is expected to vary, by ± 5% or more from the flight-planned TAS, the appropriate ATSU is to be informed.

- **Change in time estimate:**
  If the ETA for the next reporting point, FIR boundary or destination, is found to be in error by **more than 3 minutes** from that notified to Air Traffic Services, a revised ETA shall be notified as soon as possible to the appropriate ATSU.

You must inform The ATSU if your actual TAS differs by ± 5% from your flight planned TAS, or you are more than 3 minutes early or late for the next Reporting Point.

Intended Changes.

Intended changes of cruising level, route and destination are to be passed to the ATSU as soon as possible.

Weather Deterioration below Visual Meteorological Conditions (VMC).

When it becomes evident that flight in VMC will not be practicable due to weather deterioration, a controlled VFR flight shall:

- **Request an amended clearance to continue in VMC to:**

  a. Destination,

  or

  b. an alternative aerodrome,

  or

  c. leave the airspace within which an ATC clearance is required.

- **If no such clearance can be obtained, the aircraft is to:**

  a. Continue to operate in VMC,

  and

  b. notify the appropriate Air Traffic Control Unit of the action being taken (either to leave the airspace concerned or to land at the nearest suitable aerodrome),

  or

  c. if the flight is being conducted in a Control Zone, request authorisation to fly Special VFR (SVFR),

  or

  d. request clearance to operate in accordance with IFR (if the pilot is qualified and the aircraft suitably equipped).

CLOSING A FLIGHT PLAN.

- A report of arrival must be made, in person, by radiotelephony or via data link, at the earliest possible moment after landing, to the appropriate Air Traffic Service Unit (ATSU) at the arrival aerodrome.

- When no ATSU exists at the arrival aerodrome, the arrival report shall be made as soon as practicable after landing, to the nearest ATSU.

- If neither of the above is possible (due to poor communications for example), the aircraft is to make the arrival report over the air, immediately *prior* to landing, to the ATSU serving the FIR in which the aircraft is operating.

CONTENTS OF AN ARRIVAL REPORT.

Arrival reports shall contain the following information:

- Aircraft identification.
- Departure aerodrome.
- Destination aerodrome (only in the case of a diversionary landing).
- Arrival aerodrome.
- Time of arrival.

On receipt of an Arrival Report, the **flight plan** is closed.

On receipt of an Arrival Report, the flight plan is closed.

Note: Failure to comply with these provisions may cause serious disruption to air traffic services and incur great expense in carrying out unnecessary Search and Rescue (SAR) operations.

AIR TRAFFIC CLEARANCES.

General.

An ATC clearance shall be obtained prior to operating a controlled flight, or a portion of a flight operated as a controlled flight. Such clearance shall be requested through the submission of a flight plan to an ATCU.

Note: An aircraft operated on a controlled aerodrome shall not taxi on the manoeuvring area without clearance from the aerodrome control tower.

Primary Functions of Air Traffic Clearances.

The primary functions of clearances are to:

- Expedite air traffic,

and

- ensure separation between aircraft.

The receipt of an Air Traffic Clearance does not relieve the pilot from any responsibility to uphold all rules and regulations that may apply to the flight, especially from the responsibility of maintaining terrain clearance at all times.

Pilot Acceptance of a Clearance.

Many pilots, when they start to fly, are under the impression that an air traffic clearance is an instruction which must be obeyed, regardless of how inconvenient it may be. This is incorrect. If a clearance is not suitable to the Pilot-In-Command of an aircraft, he may request and, if practical, obtain an amended clearance. Normally ATC will always try and help as far as possible under these circumstances.

Responsibility of the Pilot.

It is important to remember that an air traffic clearance does not constitute authority for the pilot to violate any rule or regulation. For example, even having received a clearance, the pilot is still responsible for maintaining the required terrain clearance.

Contents of a Clearance.

The format of Air Traffic Clearances is as follows:

- Aircraft identification.
- Clearance limit - normally a geographical limit (an aerodrome, Controlled Air Space boundary, or a specific point).
- Route of flight.
- Levels of flight.
- Any other information or instruction (e.g. SSR squawk, approach or departure manoeuvres, or time of expiry of the clearance).**

Note: ** The time of expiry of the clearance indicates the time after which the clearance will be automatically cancelled if the flight has not commenced.

1. All Clearances must be read back to the Air Traffic Controller.

2. A Clearance, if unsuitable, may be changed or amended – if practical – at the request of the pilot.

Acceptance and Read-back of Clearances.

The method of accepting a clearance by the pilot is for him to read back the clearance to the ATC Controller. The Controller listens to the read-back to ascertain that the clearance has been correctly acknowledged and will take immediate action to correct any discrepancies in the pilot read-back.

Once the pilot has read back the clearance correctly, the ATC Controller will normally acknowledge by using the phrase: **"Read-back correct".**

Representative PPL - type questions to test your theoretical knowledge of ICAO Flight Plans and Clearances.

1. During a Controlled Flight, your actual TAS is 120 kts however your flight planned TAS is 115 kts. Must you inform ATSU?

   a. Only if requested by ATC
   b. Yes
   c. No
   d. Only if you are outside CAS

2. Is the PIC of an aircraft obliged to accept an ATC clearance?

   a. Yes
   b. No
   c. Only if it is an IFR clearance
   d. Only is it is to be a controlled flight

3. By when must you submit a Flight Plan prior to departure if you wish to be provided with an ATC service?

   a. 30 minutes
   b. It depends whether you intend to fly VFR or IFR
   c. It depends on whether you will be flying in Controlled Air Space (CAS) or outside CAS
   d. 60 minutes

4. What event closes a flight plan?

   a. Landing at the destination aerodrome
   b. Arriving overhead the destination aerodrome
   c. The receipt of an Arrival Report
   d. Being on short finals

5. You have flight planned to arrive over a Reporting Point at 1400Z. However, due to an unexpected tailwind, you realize that you will arrive at 1355Z. Do you have to inform the relevant ATCU?

   a. Yes
   b. No
   c. Only if you are outside Controlled Air Space
   d. Only if you are conducting the flight under Special VFR

6. Do you have to submit a Flight Plan if you are crossing the London/Brest FIR boundary under VFR?

   a. Yes
   b. No

7. You are entering an advisory route (ADR) under IFR. Do you have to submit a Flight Plan?

   a. Yes
   b. No
   c. Only if that part of the ADR is Controlled Air Space
   d. Only if that part of the ADR is an ATS route

8. You have to cross an Airway. How soon prior to penetration must you file an in-flight Flight Plan?

   a. At least 5 minutes
   b. At least 10 minutes
   c. At least 15 minutes
   d. There is no set time limit

9. Your take-off is delayed for an uncontrolled flight. At what point must you re-submit your Flight Plan?

   a. 30 minutes in excess of Estimated Off-Blocks Time (EOBT)
   b. 45 minutes in excess of EOBT
   c. 60 minutes in excess of EOBT
   d. 90 minutes in excess of EOBT

10. Must you enter your wake turbulence category in a Flight Plan?

    a. Only if the aircraft is in the Heavy category
    b. No
    c. Only if the aircraft is in the Medium or Heavy categories
    d. Yes

11. Do you have to send an in-flight Flight Plan to unexpectedly enter a CTR under SVFR?

    a. Only if you are a Controlled Flight
    b. Only if you are an Uncontrolled Flight
    c. No
    d. Yes

12. You are a Controlled VFR Flight landing at a private strip in a valley in Scotland. Your estimated landing time is exactly that which you entered in the Flight Plan prior to departure. As you descend you call ATC to inform them you are landing but receive no answer. What would be the correct course of action?

    a. No further action is necessary as your ETA is accurate
    b. Wait until your next take-off and, when airborne, inform ATC of the circumstances
    c. Assume your radio has failed and have it tested as soon as possible after landing
    d. Either climb and re-establish communications with ATC or telephone ATC as soon as possible (and within 30 minutes) after landing passing them your Arrival Report

13. What is one of the primary functions of an Air Traffic Clearance?

    a. To agree to allow a flight to proceed
    b. To ensure separation of aircraft
    c. To acknowledge that the information of the flight details have been logged by ATC
    d. To acknowledge that ATC is now responsible for the flight

14. How is an abbreviated Flight Plan normally submitted?

    a. By e-mail or fax
    b. Over the radio or by telephone
    c. By filling out only specific parts of the Flight Plan form
    d. In person

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer												

Question	13	14
Answer		

The answers to these questions can be found at the end of this book.

CHAPTER 7
AERONAUTICAL INFORMATION SERVICES (ICAO)

Aeronautical Information Service
CCN
Vooruitgangstraat, 80 Bus 2
B - 1030 Brussel

Belgocontrol

Aeronautical Information Service
CCN
Rue du Progrès, 80 Boîte 2
B - 1030 Bruxelles

TEL : ++32 (0) 2 206 22 19 (Manager)
++32 (0) 2 206 22 97 (Customer Service)
FAX : ++32 (0) 2 206 22 21
AFS : EBVAYOYX

AIC
05
26 MAR 1998

INFORMATION AT THE REQUEST OF THE CIVIL AVIATION AUTHORITY

VALIDATION OF LICENCES

1. The holder of a valid pilot licence for aeroplanes, helicopters, gliders or free balloons issued by a Member State of the European Community in compliance with the specifications of Annex 1 to the Chicago Convention may exercise, without any further formality, the privileges granted by that licence in a Belgian registered aircraft certificated for single-pilot operation in order to make private flights by day and under VFR, provided that he meets the recent flight experience requirements imposed by the issuing State.

2. In order to make other than private flights, licences issued by a Member State of the European Community must be rendered valid as previously.
Licences issued by non-Member States of the European Community must be rendered valid in all cases.

AIC NR 06/92 is hereby cancelled.

GENERAL.

The general aviation pilot does not need to know much about ICAO **Aeronautical Information Services**. Rather, he should study the Aeronautical Information Publications issued by the State in which he flies. The following brief outline of ICAO **Aeronautical Information Services** has been included for background purposes only. The private pilot flying in the United Kingdom is strongly advised to study Chapter 15 concerning Aeronautical Information issued by the United Kingdom Civil Aviation Authority.

RESPONSIBILITIES AND FUNCTIONS.

Each contracting state shall:

- Provide an aeronautical information service,

or

- agree with one or more other contracting state(s) for the provision of a joint information service,

or

- delegate the authority for the provision of the information service to a non-government organisation.

Provision.

A State's **Aeronautical Information Service** shall ensure that the information necessary for the safety and efficiency of air navigation is made available for the operational requirements of:

- Those involved in flight operations (including flight crews), flight planning and flight simulators

and

- the Air Traffic Services Units (ATSUs) responsible for providing a Flight Information Service, and services responsible for pre-flight information.

Integrated Aeronautical Information Package.

Aeronautical information shall be published by States as an **Integrated Aeronautical Information Package** which comprises:

- An Aeronautical Information Publication (AIP) including an amendment service.
- Supplements to the AIP.
- NOTAMs, (Notices to Airmen) including checklists and summaries of valid NOTAMs.
- Pre-flight Information Bulletins (PIB).
- Aeronautical Information Circulars (AIC).

THE AERONAUTICAL INFORMATION PUBLICATION.

General.

A State's **Aeronautical Information Publication** (AIP) constitutes the basic information source for information of a lasting character essential to air navigation.

The AIP is divided into 3 Parts :

Part 1 General (GEN).

Part 2 En-route (ENR).

Part 3 Aerodromes (AD).

Layout.

The **AIP** is divided into 3 Parts:

Part 1 **General (GEN).**

Part 2 **En-route (ENR).**

Part 3 **Aerodromes (AD).**

These parts are described in detail in Chapter 15, for the United Kingdom.

AIP Amendments and Supplements.

Permanent changes to the **AIP** are published as **AIP Amendments**. Temporary changes are published as **AIP Supplements** and must be kept in the AIP, as long as all or some of their contents remain valid.

Notices to Airmen (NOTAM).

NOTAMs are issued promptly for operationally significant aeronautical information which is composed of:

- Changes of a temporary and short-term nature (e.g. activation of a temporary Danger Area),

or

- permanent changes (e.g. introduction of a new Airway),

or

- temporary changes of long duration which are made at short notice (e.g. emergency and major repairs to a runway).

Checklists of valid **NOTAMS** are issued at intervals of not more than one month.

Pre-flight Information Bulletins.

Pre-Flight Information Bulletins are briefing Bulletins prepared at each aerodrome for aircrew. They contain the **NOTAMs** relevant to that particular aerodrome and other local operational information (e.g. the presence of temporary hazards at the aerodrome, and maintenance work on the movement area; failure of any of the aerodrome lighting system etc).

Aeronautical Information Circulars.

An **Aeronautical Information Circular** (AIC) is issued whenever it is necessary to promulgate aeronautical information which does not qualify for inclusion in the **AIP** or in a **NOTAM**; for example:

- Long-term forecasts of major changes in legislation, regulations, procedures or facilities.
- Information of a purely explanatory or advisory nature liable to affect flight safety.
- Information or notification of an explanatory or advisory nature concerning technical, legislative or purely administrative matters.

	REPUBLIC OF SOUTH AFRICA CIVIL AVIATION AUTHORITY	CAA Private Bag X08 Waterkloof 0145
Tel: (012) 346 5566 Fax: (012) 346 6059 E-Mail: mail@caa.co.za	AERONAUTICAL INFORMATION CIRCULAR	AIC 14·4 01-08-15

GENERAL

TRAINING

TRAINING OF PRIVATE PILOTS: SPINNING.

Λ Indicates changes

Λ1. This AIC replaces AIC 14·4 dated 1994-01-15.

Λ2. It has come to the attention of this Authority that many student pilots are not proficient in spinning exercises when applying for a Private Pilot's Licence.

3. The attention of all instructors, training organisations and pilots is drawn to the Flight Instruction Syllabus as published in Chapter 4 of the Air Navigation Regulations. 1976, as amended.

Sequence 14 reads inter alia:-

14 Spinning
(a) Full spin
(b) Incipient spin

4. All instructors, training organisations and pilots are hereby reminded that the execution of a full spin or incipient spin and recovery is a mandatory requirement before a student may fly solo.

This must be clearly reflected:-

(a) On the Flight Authorisation Sheet.

(b) In the students Training File, and

(c) In the student's Logbook suitably certified by a Gr. I or a Gr. II instructor.

COMMISSIONER FOR CIVIL AVIATION

Figure 7.1 AIC Issued by the Civil Aviation Authority of South Africa.

Representative PPL - type questions to test your theoretical knowledge of Aeronautical Information Services (ICAO).

1. Contracting States are responsible for providing an Aeronautical Information Service for the operational requirements of:

   a. Flight Crew only
   b. Operational staff only
   c. Those involved in Flight Operations (including flight crew), flight planning, flight simulators and the ATSU responsible for pre-flight information
   d. All flight crew, ATC and Operations staff

2. What are the names of the 3 parts of an AIP?

   a. AGA, AD and GEN
   b. ENR, AGA and GEN
   c. ENR, AD and AGA
   d. GEN, ENR and AD

3. What kind of information is contained in a NOTAM?

   a. Information of permanent changes only
   b. Temporary and short-termed information only
   c. Temporary changes of long duration which are made at short notice
   d. Information of permanent changes, temporary and short-term information and temporary changes of long duration which are made at short notice

4. What information is contained in a Pre-Flight Information Bulletin (PIB)?

   a. NOTAMS and local operational information relevant to a particular aerodrome
   b. Information of major changes (e.g. the introduction of a new airway)
   c. Details of Danger, Restricted and Prohibited Areas within the UK
   d. Information of general interest to pilots (e.g. information with regards to low level turbulence or altimeter errors)

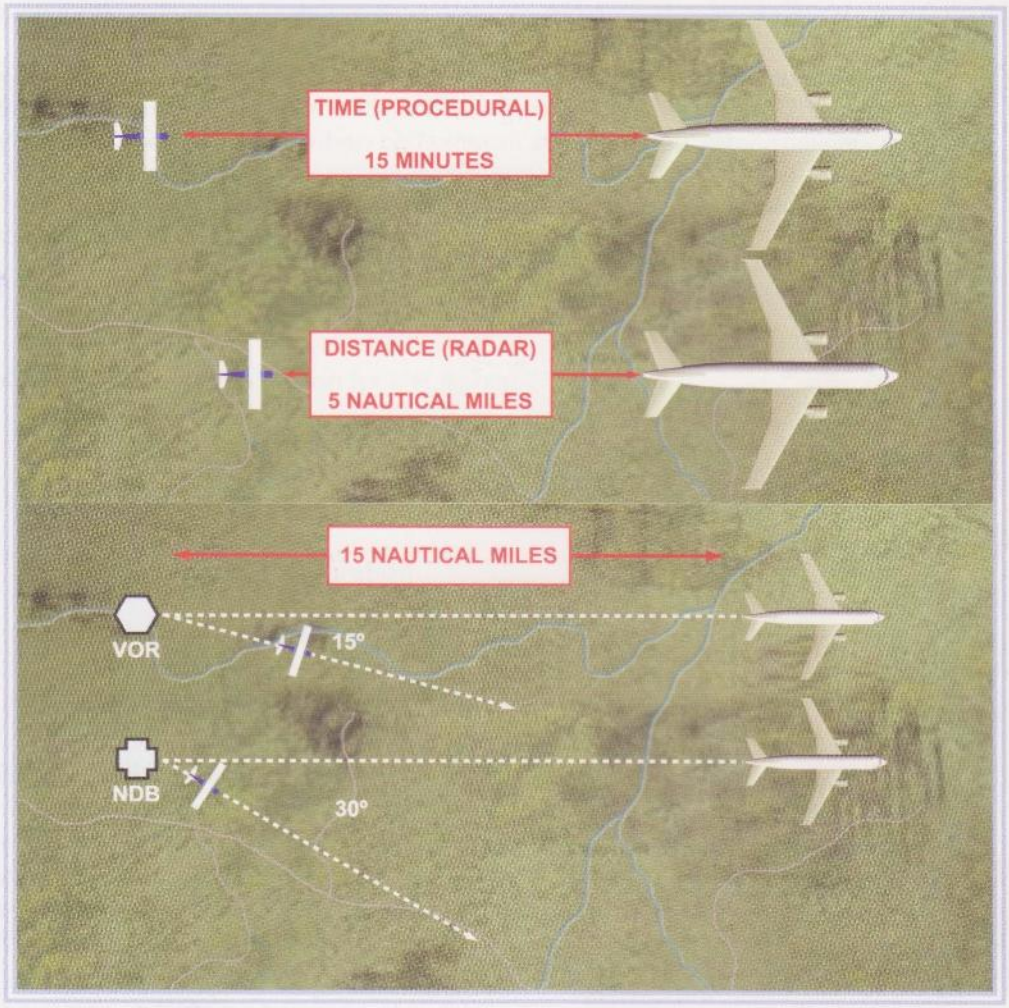
5. How is information of a purely explanatory or advisory nature published?

   a. In a NOTAM
   b. In an Aeronautical Information Circular
   c. In an AIRAC
   d. In an Pre-Flight Information Bulletin

Question	1	2	3	4	5
Answer					

The answers to these questions can be found at the end of this book.

CHAPTER 8
SEPARATION (ICAO)



SEPARATION (ICAO).

General.

A broad definition of **separation** is the minimum distance or time between two aircraft that are either occupying the same altitude or Flight Level or climbing/descending through the same altitude or Flight Level.

However, there are times when it is possible that two aircraft may get so close to each other that one could be affected by the wake vortices of the other. This could happen on landing or taking-off, when both aircraft are using the same runway. In such a case, a mandatory minimum safety distance, or time, is laid down by the Authorities. This type of **separation** is called **Wake Turbulence Separation**. **Wake Turbulence Separation** is covered at the end of this Chapter.

TYPES OF SEPARATION.

There are three types of **separation** for IFR flights:

- **Vertical Separation**.
- **Horizontal Separation** which is subdivided into:
  a. **Longitudinal Separation**.
  b. **Lateral Separation**.
- **Composite Separation**.

SCOPE OF THIS CHAPTER.

Vertical Separation is covered in Chapter 2 **ICAO Rules of the Air**. **Composite Separation** is not included in the syllabus for the Private Pilot, so will not be dealt with here. This chapter limits itself to coverage of **ICAO Horizontal Separation** and **ICAO Wake Turbulence Separation**.

HORIZONTAL SEPARATION.

As stated above, **Horizontal Separation** is sub-divided into **Longitudinal** and **Lateral Separation**.

LONGITUDINAL SEPARATION.

General.

Longitudinal Separation can either be based on time (Procedural) or distance (when the aircraft is under the Radar Control).

Longitudinal Separation Based on Time (Procedural).

The normal minimum **longitudinal separation** between two aircraft following the same track is **15 minutes**.

Longitudinal Separation Based on Distance (Radar).

The normal minimum longitudinal radar separation between two aircraft following the same track is **5 nautical miles**.

Note: **Separation** can be reduced under certain circumstances.

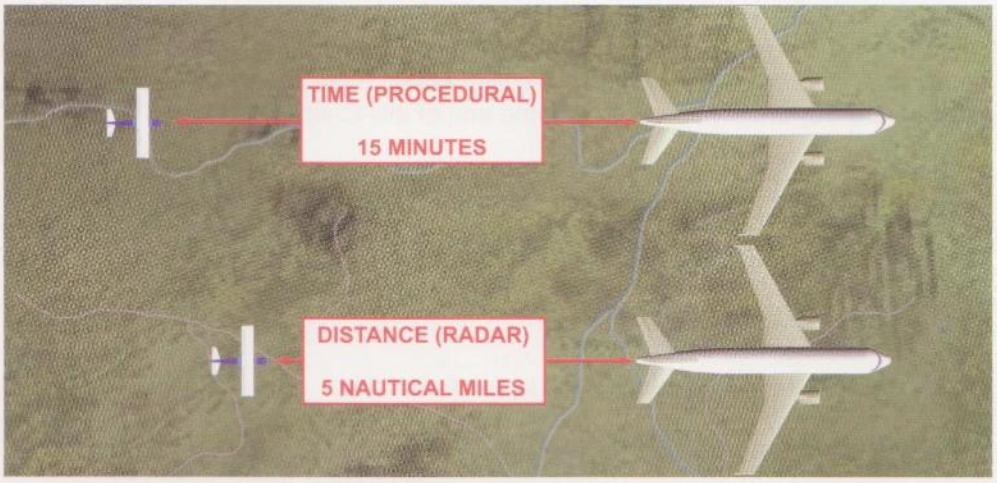


Figure 8.1 Time and Distance Separations (not to scale).

LATERAL SEPARATION.

Lateral Separation is based upon **time only**, and depends on the radio navigation aid that the two aircraft which are to be separated from each other are using.

Separation for aircraft using VOR and NDB is as follows:

VOR	15° at 15 nautical miles
NDB	30° at 15 nautical miles

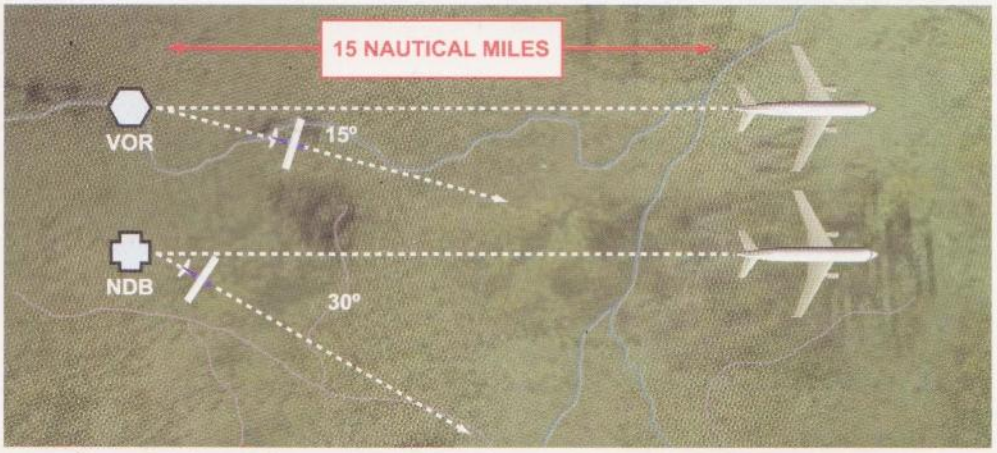


Figure 8.2 Lateral Separation for aircraft using VOR and NDB Navigational Aids.

If the aircraft are not using a navigational aid, but are navigating according to Dead Reckoning (DR) principles, **lateral separation** is increased to **45° at 15 nautical miles**.

WAKE TURBULENCE SEPARATION.

When is Wake Turbulence Separation Applied?

Wake Turbulence Separation is applied under the following circumstances:

- When two aircraft are using the same runway, either for take-off or landing.
- Whenever the following aircraft is at the same height as, or less than 1 000 feet below, the leading aircraft.

Note: The pilot is always responsible for the safety of the aircraft and should add either further distance or time to the allocated separation factors if there is concern that the wake turbulence separation allowed by Air Traffic Control is not sufficient.

The pilot is always responsible for the safety of the aircraft and should add either distance or time if there is concern that, due to circumstances, the wake turbulence separation allowed for by Air Traffic is not sufficient.

Types of Wake Turbulence Separation.

Similarly to **Longitudinal Separation**, **Wake Turbulence Separation** can either be based on **time** (Procedural) or **distance** (when the aircraft is under the control of Radar).

Wake Turbulence Categories of Aircraft.

Since the **severity** of the **wake turbulence** is a factor of **aircraft mass**, the amount of **separation** time or distance is based upon the **Wake Turbulence Category** of the aircraft concerned. The categories are as follows:

Wake Turbulence Category of Aircraft	Minimum Take-Off Mass
Heavy	136 000 kgs and above
Medium	Below 136 000 kgs and above 7 000 kgs
Light	7 000 kgs and below

Wake Turbulence Categories:

Heavy
136 000 kgs and above.

Medium
Below 136 000 kgs and above 7 000 kgs.

Light
7 000 kgs and below.

Wake Turbulence Separation on Departure.

On departure, **Wake Turbulence Separation** is the minimum time from when the leading aircraft becomes airborne to the time when the following aircraft becomes airborne.

On departure, then, **Wake Turbulence Separation** is based only upon time (Procedural) and will depend on whether:

- Both aircraft are departing from the same point on the runway,

or

- the following aircraft is departing from an intermediate point of the runway.

A light aircraft taking off behind a heavy aircraft, and departing from the same point on the runway should allow a minimum of 2 minutes Wake Turbulence Separation.

If both aircraft are departing from the same runway, the **Wake Turbulence Separation** is as follows:

Leading Aircraft	Following Aircraft	Separation Minima
Heavy	Medium or Light	2 minutes
Medium	Light	2 minutes

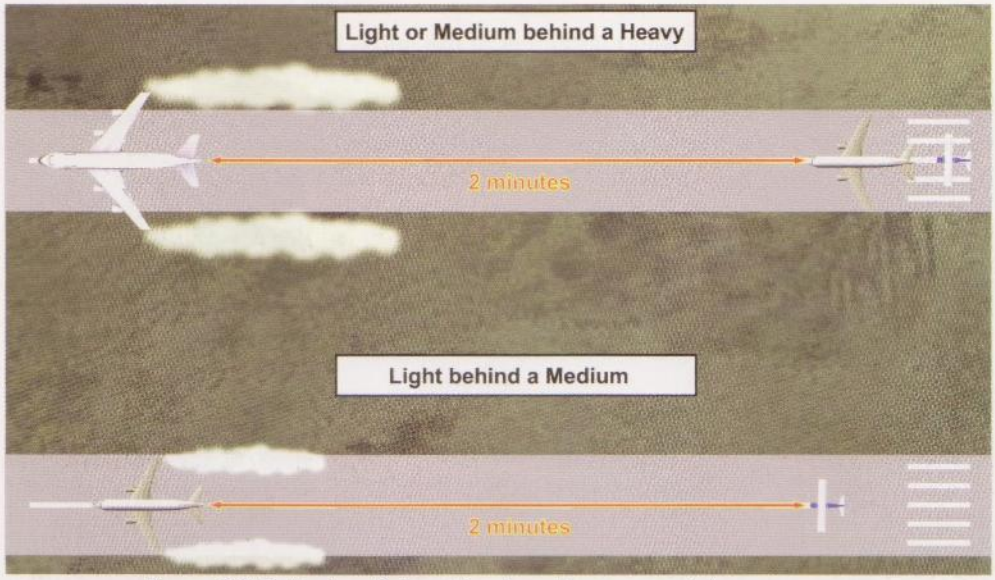


Figure 8.3 Both aircraft departing from the same point on a runway.

If the "following" aircraft is departing from an intermediate point on the runway, **Wake Turbulence Separation** is as follows:

Leading Aircraft	Following Aircraft	Separation Minima
Heavy	Medium or Light	3 minutes
Heavy or Medium	Light	3 minutes

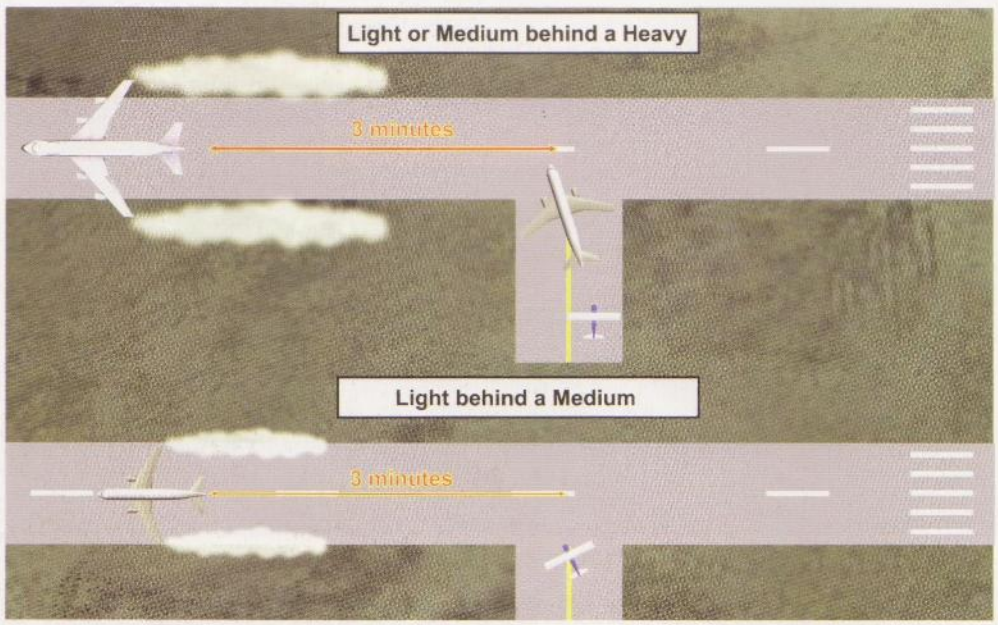


Figure 8.4 Following aircraft departing from an Intermediate point on the runway.

A light aircraft taking off from an intermediate point on a runway behind a medium or heavy aircraft should allow at least 3 minutes separation.

ARRIVING AIRCRAFT.

General.

Wake Turbulence Separation for arriving aircraft can be of two types:

- **Procedural** (non-radar): **Wake Turbulence Separation** which is measured in **time**.
- **Radar**: **Wake Turbulence Separation** which is measured in **distance**: provided to aircraft under radar control.

Procedural (non-radar) Wake Turbulence Separation.

The following times apply:

Leading Aircraft	Following Aircraft	Separation Minima
Heavy	Medium	2 minutes
Medium or Heavy	Light	3 minutes

Radar Wake Turbulence Separation.

Under **radar** separation, the following distances apply:

Leading Aircraft	Following Aircraft	Separation Minima
Heavy	Heavy	4 nautical miles
Heavy	Medium	5 nautical miles
Heavy	Light	6 nautical miles
Medium	Light	5 nautical miles

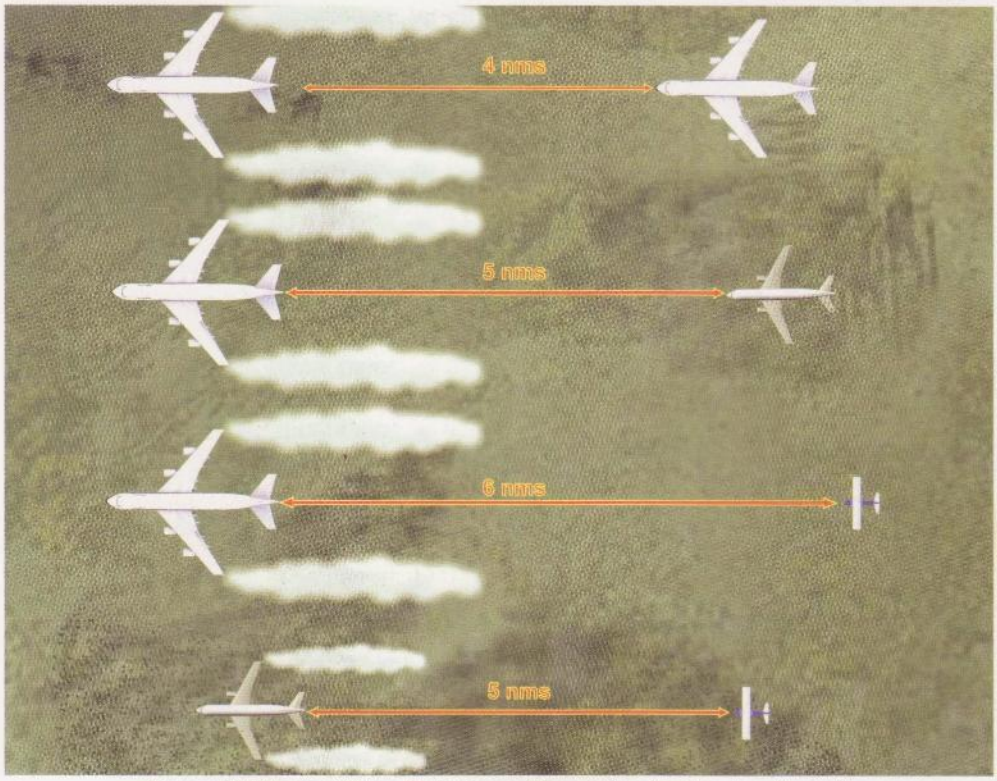


Figure 8.5 Radar Wake Turbulence Separation for Arriving Aircraft.

If the separation between yourself and a heavier aircraft is causing you concern, you must request clearance from Air Traffic Control to increase the separation minima.

REMEMBER !!

If the separation between yourself and a heavier aircraft is causing you concern, you must request clearance from Air Traffic Control to increase the separation minima.

Reduced Separation.

All the separation minima dealt with in this chapter may be reduced under certain circumstances.

Representative PPL - type questions to test your theoretical knowledge of Separation (ICAO).

1. A light aircraft is entering a runway from an intermediate point, following a heavy aircraft which is taking-off. What is the minimum wake turbulence separation which must be applied?

   a. 1 minute
   b. 2 minutes
   c. 3 minutes
   d. 4 minutes

2. ICAO divides separation into three types. These are:

   a. Lateral, Longitudinal and Vertical
   b. Vertical, Longitudinal and Composite
   c. Vertical, Lateral and Composite
   d. Vertical, Horizontal and Composite

3. What is the normal minimum longitudinal radar separation between two aircraft following the same track?

   a. 5 nautical miles
   b. 5 minutes
   c. 15 minutes
   d. 10 nautical miles

4. Which of the following statements is true?

   a. Procedural (non-radar) wake turbulence separation is measured in distance
   b. Radar wake turbulence separation is measured in time
   c. Radar separation is normally closer than procedural separation
   d. Procedural separation is normally closer than radar separation

5. What is the normal minimum, longitudinal, non-radar separation between two aircraft following the same track?

   a. 15 nautical miles
   b. 15 minutes
   c. 10 nautical miles
   d. 10 minutes

6. What is the minimum, lateral separation between two aircraft using the same VOR?

   a. 15° at 15 nautical miles
   b. 30° at 15 nautical miles
   c. 45° at 15 nautical miles
   d. 30° at 20 nautical miles

7. In which of the following circumstances is wake turbulence separation applied?

   a. When operating below 700 feet, on finals
   b. Whenever the following aircraft is at the same height as, or less than 1 000 feet above the leading aircraft
   c. Whenever the following aircraft is at the same height as, or less than 1 000 feet below the leading aircraft
   d. Whenever the following aircraft is at the same height as, or less than 500 feet below the leading aircraft

8. What is the Maximum Take-Off Mass of a medium category aircraft in terms of its Wake Turbulence Category?

   a. Between 136 000 kgs and 7 000 kgs inclusive
   b. Below 136 000 kgs and above 7 000 kgs
   c. Below 130 000 kgs and above 7 000 kgs
   d. Below 136 000 kgs and above 8 000 kgs

9. If the pilot of a following aircraft is concerned about the separation he has been given by ATC, what action should be taken?

   a. None. ATC are solely responsible for separation between aircraft and have their own safety factors built in to separation minima
   b. The pilot should inform ATC about his concern and receive clearance to increase the separation between the two aircraft
   c. The pilot must increase the separation between the two aircraft. There is no need to inform ATC since the pilot ultimately is responsible for the safety of the aircraft
   d. The pilot must decrease the separation between the two aircraft. There is no need to inform ATC since the pilot ultimately is responsible for the safety of the aircraft

10. What is the minimum wake turbulence separation between a light aircraft taking off behind a heavy aircraft from the same point on the runway?

    a. 5 minutes
    b. 5 nautical miles
    c. 2 minutes
    d. 2 nautical miles

Question	1	2	3	4	5	6	7	8	9	10
Answer										

The answers to these questions can be found at the end of this book.

CHAPTER 9
AERODROMES

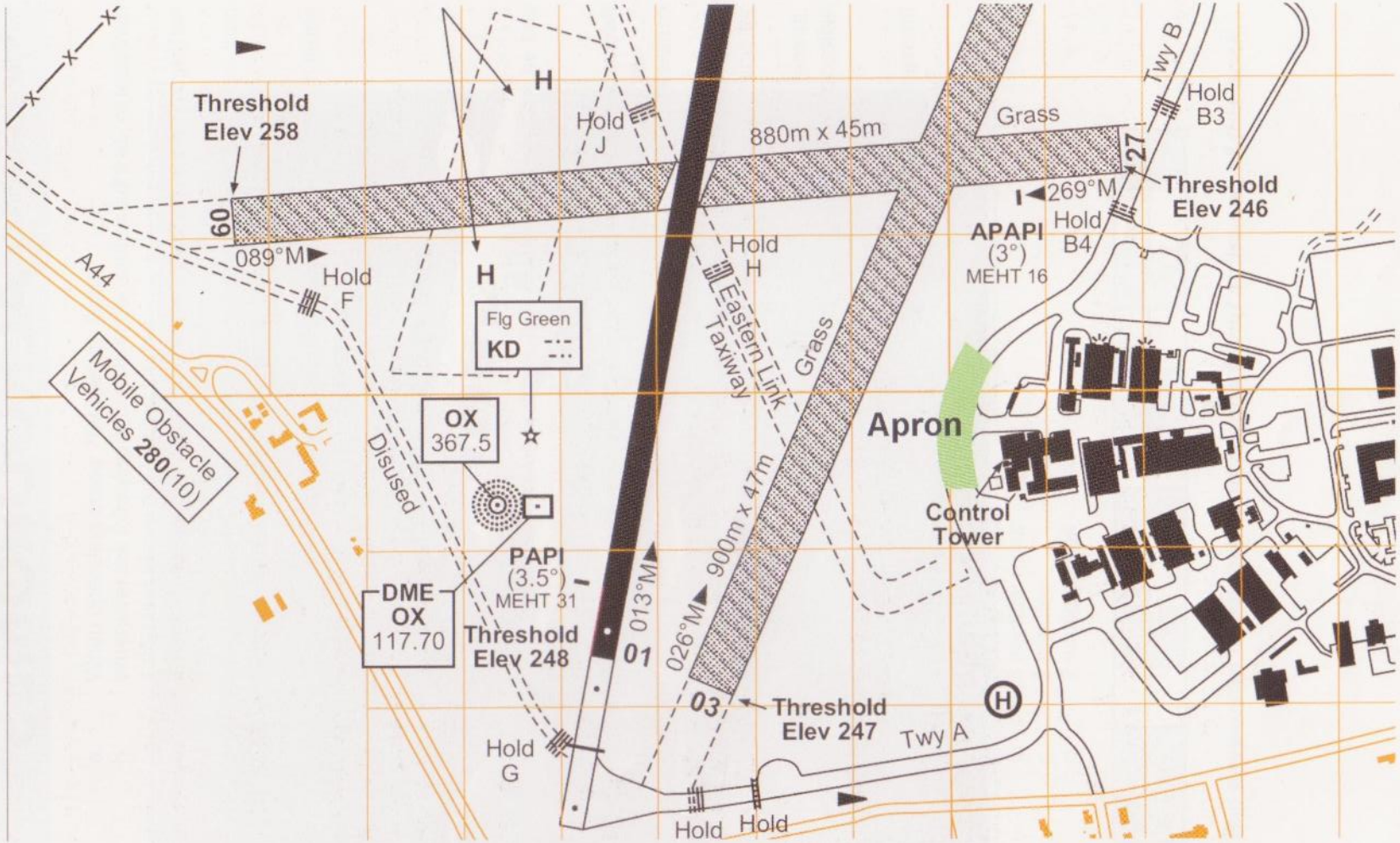


Figure 9.1 The aerodrome layout is, basically, divided into the Movement Area, the Apron, and the Manouevring Area.

INTRODUCTION.

The definition of "**aerodrome**" is given in Annex 14 to the Convention on International Civil Aviation (Chicago).

An **aerodrome** is a defined area on land or water (including any buildings, installations, and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome is also defined in Section 105 of the UK Civil Aviation Act 1982. That definition reads:

(The word **aerodrome**) "...means any area of land or water designed, equipped, set apart or commonly used for affording facilities for the landing and departure of aircraft and includes any area or space, whether on the ground, on the roof of a building or elsewhere, which is designed, equipped or set apart for affording facilities for the landing and departure of aircraft capable of descending or climbing vertically."

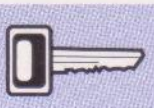
Those **aerodromes** where flights for the purpose of public transport operations and/or flying training take place must be licensed.

In the United Kingdom, the CAA is responsible for ensuring that the holders of an **aerodrome** licence are competent and suitable persons to exercise the privileges of that licence.

Many **aerodromes** do not need a licence to carry out flying activities, although, in the United Kingdom, the CAA is still responsible for all matters affecting the safety of aircraft at **aerodromes** through its regulation of aircraft operations and maintenance.

Basic Definitions.

The basic division of an aerodrome layout is covered by three terms: the **apron**, the **movement area** and the **manoeuvring area**. *(See Figure 9.1, opposite.)*



The three basic divisions of an aerodrome are: the apron, the manoeuvring area, and the movement area.

The Apron.

The **apron** is a defined area on an aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail, cargo, fuelling, parking or maintenance.

The Movement Area.

The **movement area** is part of an aerodrome which is used for the take-off, landing or taxiing of aircraft, consisting of the **manoeuvring area** and the **apron(s)**.

The Manoeuvring Area.

The **manoeuvring area** is that part of an aerodrome which is used for the take-off, landing and taxiing of aircraft, excluding aprons.

CONDITIONS OF THE MOVEMENT AREA AND RELATED FACILITIES.

Information.

Up-to-date information on the conditions of the **Movement Area** and the operational status of related facilities is provided to Flight Information Service units so that this information can be passed to departing and arriving aircraft. Information on the **movement area** includes:

- Construction or maintenance work.
- Rough or broken surfaces on a runway, taxiway or apron.
- Snow, slush or ice on a runway, taxiway or apron.
- Water on a runway, taxiway or apron.
- Snow banks or drifting snow on a runway, taxiway or apron.
- Anti-icing or de-icing liquid chemicals on a runway or taxiway.
- Other temporary hazards including parked aircraft.
- Failure or irregular operation of part or all of the aerodrome visual aids.
- Failure of the normal or secondary power supply on a runway, taxiway or apron.

Water on a Runway.

Whenever water is present on a runway, a description of the runway surface conditions must be made available using the following terms:

- **DAMP** - the surface shows a change of colour due to moisture.
- **WET** - the surface is soaked but there is no standing water.
- **WATER PATCHES** - significant patches (25% of runway) of standing water are visible.
- **FLOODED** - extensive standing water is visible.

Every aerodrome must have at least one windsock and, if it is used at night, the windsock must be lit.

VISUAL AIDS FOR NAVIGATION.

Wind Direction Indicators (Windsocks).

Every aerodrome must have at least one windsock and, if the aerodrome is to be used at night, the windsock must be lit.

Landing Direction Indicator (T).

The landing 'T' is used to indicate the direction in which an aircraft is to land.

- Where provided, a landing direction indicator should be located in a conspicuous place on the aerodrome.
- Landings must be made in the direction of the cross bar of the 'T'.
- If it is to be used by night, the landing indicator must either be illuminated or outlined by white lights.

Figure 9.2 Landing Direction Indicator.

Signalling Lamp.

A signalling lamp must be provided at a controlled aerodrome in the aerodrome Control Tower. The signalling lamp is normally used for signalling messages to aircraft, in the event of loss of radio communications.

The lamp is hand-held and is capable of either shining a coloured steady light or emitting coloured flashes in red, white or green.

The signalling lamp must be capable of being aimed manually at any target required and must also be capable of transmitting a message, in any of the 3 colours, by Morse Code up to a speed of at least 4 words a minute.

Figure 9.3 A signalling lamp.

SIGNALS PANELS AND SIGNALS SQUARE.

Location.

The **signals square** should be located so as to be seen clearly from the air when viewed from a height of 300 m and should be surrounded by a white border. The signalling area must be on an even, horizontal surface.

The absence of a signal area at an aerodrome normally signifies that, except in an emergency, only radio-equipped aircraft are accepted. *(See Figure 9.4, overleaf.)*

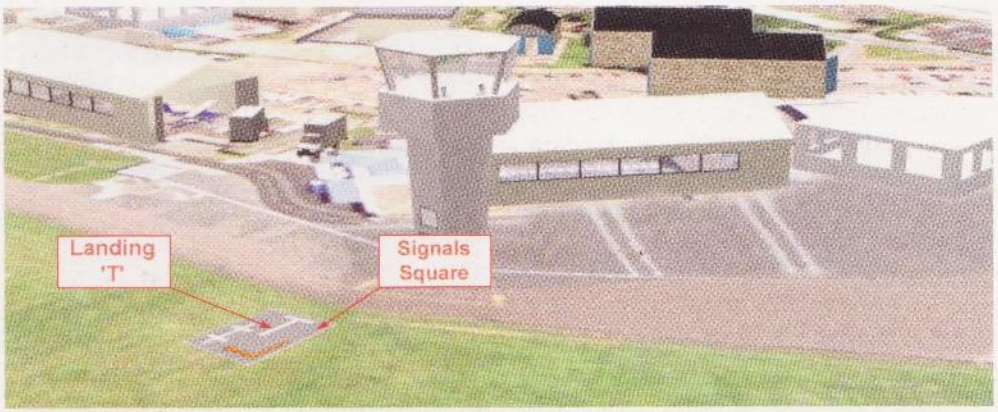


Figure 9.4 Tower and Signals Square.

AERODROME MARKINGS.

Colours and Conspicuity.

- Runway markings are white. *(See Figure 9.5 et seq.)*
- Taxiway markings are yellow. *(See Figures 9.11.)*
- Apron safety lines are of any conspicuous colour which contrasts with that used for aircraft stand markings.
- At aerodromes where operations take place at night, all markings should be made with reflective materials.

The absence of a signals square at an aerodrome signifies that, except in an emergency, only radio equipped aircraft are accepted.

RUNWAY MARKINGS.

Runway Designation Markings.

Runway designation markings for single runways consist of a 2-digit number which indicates the direction of take-off and landing to the nearest 10° with reference to **magnetic north**. For example, a runway designated as **Runway 23** would be aligned in the direction 230° Magnetic, to the nearest 10°. This means that

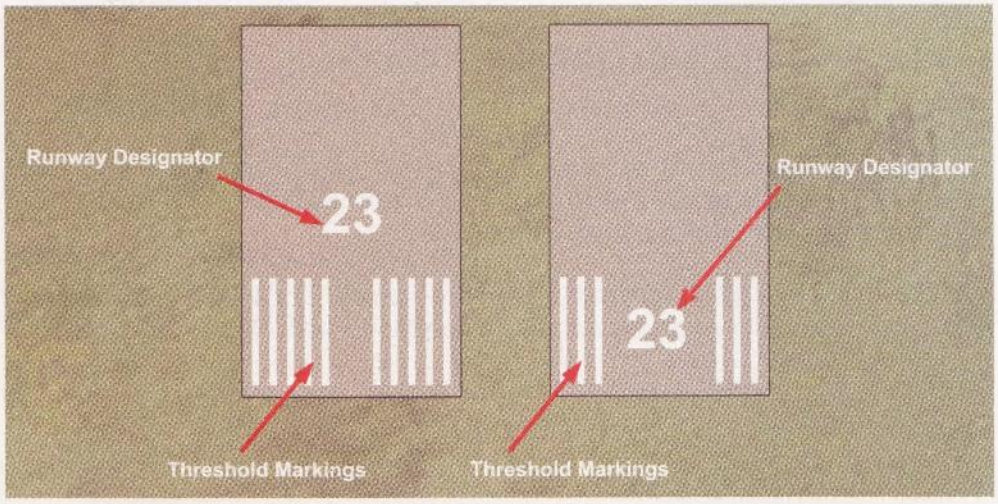


Figure 9.5 Runway Designators for single runways.

an aircraft taking off from, or approaching to land on Runway 23 would have 230°, or nearly so, indicated on the magnetic compass, provided there was no crosswind component. If a runway designated Runway 23 were being used for take-offs and landings in the opposite direction, the runway would be designated Runway 05, that is, 180° from 230° Magnetic. **Runway alignment** is sometimes referred to as **runway heading**.

Runway designation markings are located at the **threshold** of a runway, either above or among the threshold markings, as shown in *Figure 9.5, previous page*. **Runway designation markings** for parallel runways are supplemented by a letter.

Runway markings are coloured white.

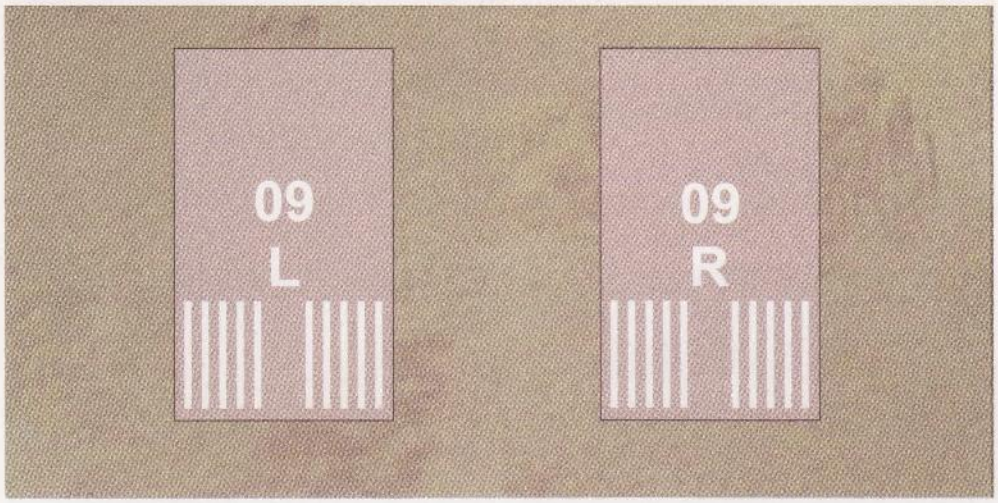


Figure 9.6 Runway designators for parallel runways, left and right.

For a dual parallel runway, the letters would be: **L = Left R = Right**, as shown in *Figure 9.6*. If an aerodrome has three parallel runways, such as Los Angeles International, the centre runway would carry the letter C.

Runway Centre-Line Marking.

All paved runways are provided with centre-line markings, consisting of uniformly spaced white stripes and gaps.

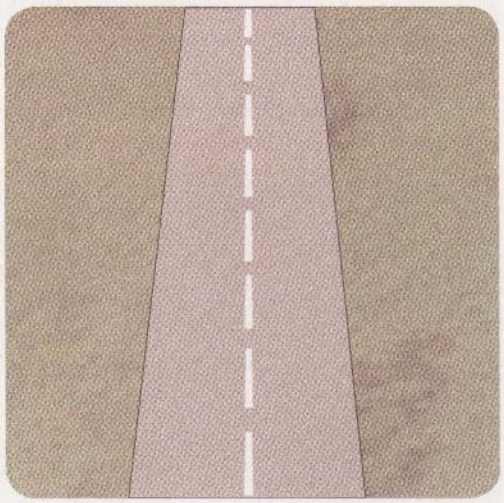


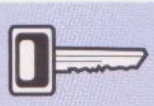
Figure 9.7 Runway centre-line markings.

Threshold Marking.

Threshold marking consists of a pattern of longitudinal stripes. The number of stripes varies with the runway width.

Transverse Stripe & Displaced Thresholds.

To indicate that the **threshold** is **displaced** from the end of the runway, a white transverse stripe is placed immediately in front of the **threshold markings,** thus creating a **pre-threshold area**.



A transverse white stripe marking on a runway signifies a displaced threshold.

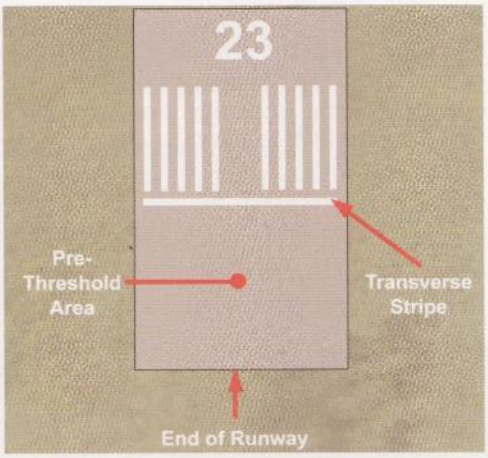


Figure 9.8 Displaced threshold.

Pre-threshold Area .

Various markings may be used on the **pre-threshold area.** The most important are as follows:

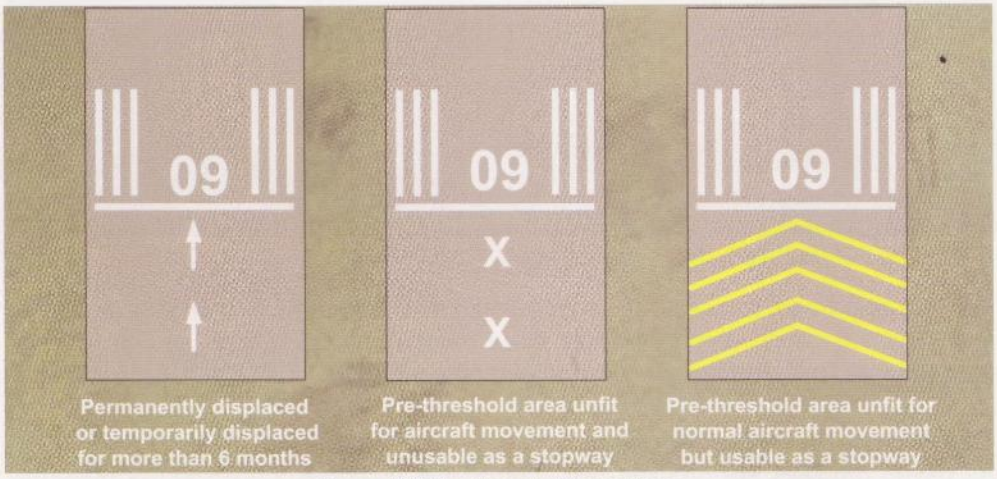


Figure 9.9 Pre-threshold markings.

Aiming Point.

The runway **aiming point** consists of two conspicuous white stripes on instrument runways, between 300 m and 400 m from the threshold (depending on the length of the runway).

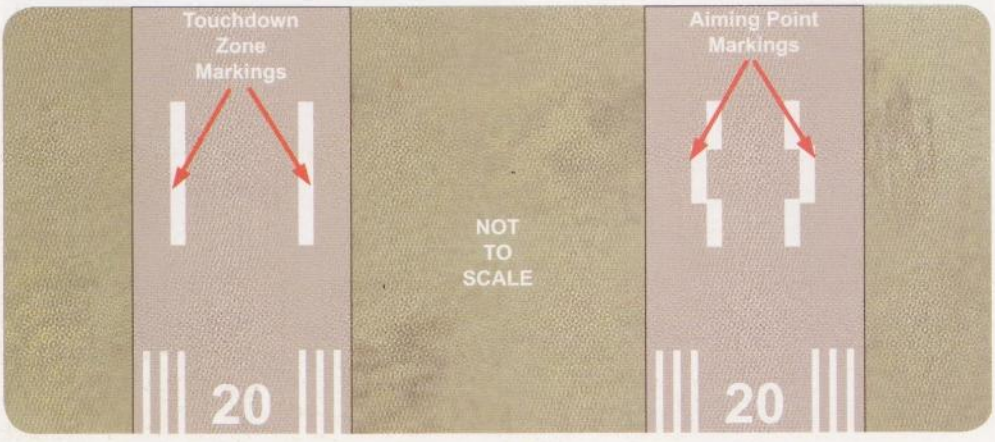


Figure 9.10 Aiming point and touchdown zone markings.

TAXIWAY MARKINGS.

In general, taxiway markings are yellow in colour and consist, principally, of **centre-line**, **runway holding position**, and **edge markings.**

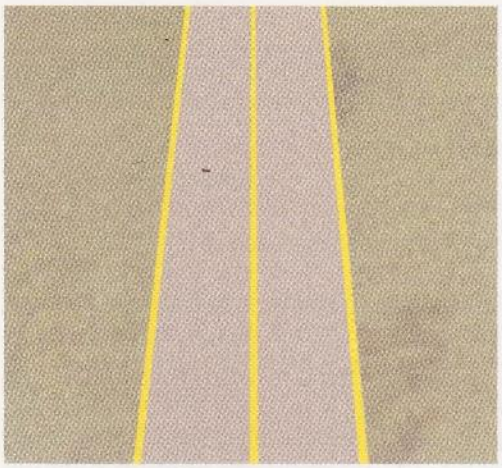


Figure 9.11 Taxiway centre-line and edge markings.

Taxiway Centre-Line Marking.

The **taxiway centre-line marking** is a continuous yellow line. A pilot should taxi his aircraft on the **centre-line** unless there is a good reason not to. With the aircraft on the centre-line, the aircraft's wing tips should be clear of any obstacles. It is the pilot's responsibility to avoid conflicting with other traffic.

Taxiway Edge Markings.

Taxiway edge markings should be used whenever it is necessary to separate a taxiway from a pavement that is not intended for aircraft use, or to mark the edge of a taxiway which is not otherwise clearly visible.

Runway Holding Position Markings.

To protect aircraft on take-off and landing, **runway holding position markings** are located on all taxiways that lead into a runway. Taxiing aircraft must not cross **holding position markings** without permission from ATC, nor until the pilot has checked that the approach is clear. There are two different **runway position markings**: **Pattern A** and **Pattern B**. *(See Figure 9.12.)*

Runway Holding Position Markings - Pattern A.

Pattern A markings consist of four yellow lines at right angles to the taxiway centre-line. The two lines nearer to the runway are broken. *(See Figure 9.12.)*

- **Pattern A holding point markings** are used if there is only one holding point.
- When used in conjunction with **Pattern B**, **Pattern A** markings are always used to denote the **holding point** closest to the runway.

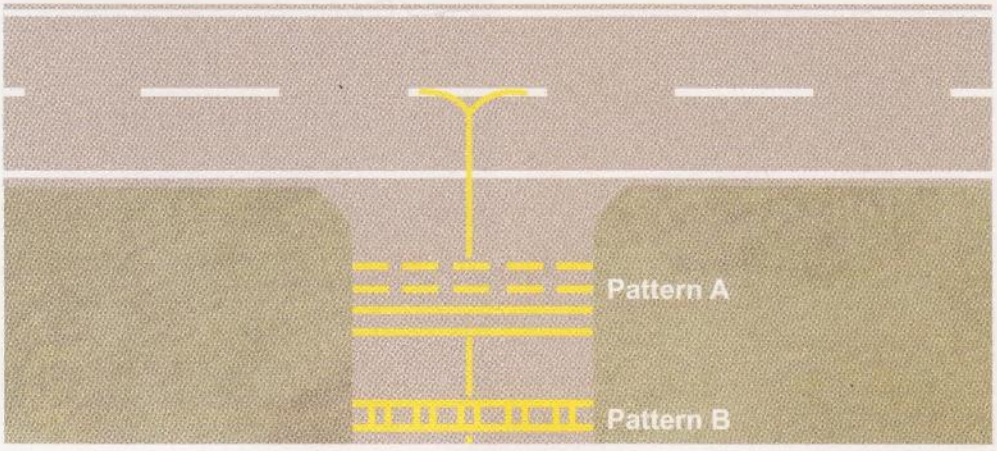


Figure 9.12 Runway holding position markings.

A pair of parallel yellow lines together with a pair of parallel yellow broken lines across a taxiway marks a holding point just short of a runway entry point, beyond which an aircraft may not proceed without an ATC clearance.

- The **Pattern A** marking is the **holding point** for all aircraft operating VFR.

- A pilot must always stop at a **Pattern A holding point** and proceed onto the runway only when cleared to do so by ATC, or if there is no ATC, when the pilot has ascertained that there is no conflicting traffic.

Runway Holding Point Markings - Pattern B.

Pattern B markings consist of 2 solid yellow lines at right angles to the taxiway centre-line, joined by cross lines to form a pattern which resembles a ladder. *(See Figure 9.12 previous page.)*

- **Pattern B holding point markings** are used if there is more than one holding position.

- The **Pattern B holding point** is the position further away from the runway, (normally for larger aircraft when low visibility operations are in progress).

Intermediate Holding Position Markings.

Intermediate holding position markings are used at the intersection of two paved taxiways in order to protect a priority taxiway. An **intermediate holding position marking** is a single broken yellow line. *(See Figure 9.13.)*

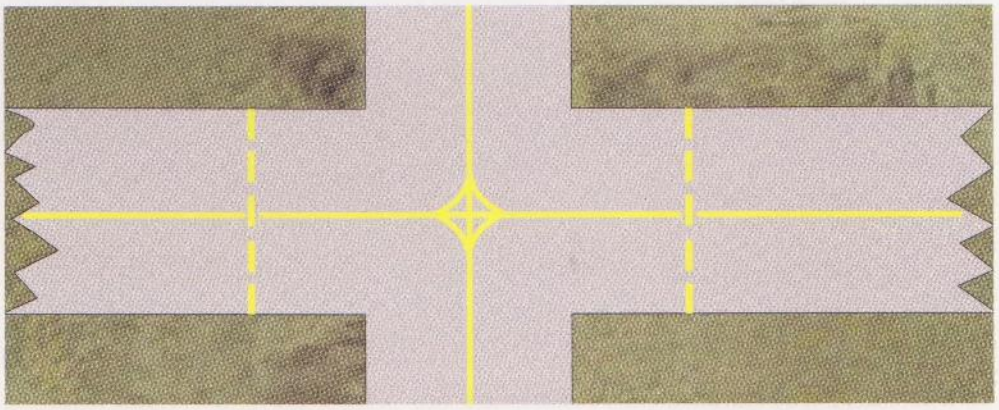


Figure 9.13 Intermediate holding position markings.

Apron Markings.

Apron markings, intended for the guidance of pilots are painted yellow.

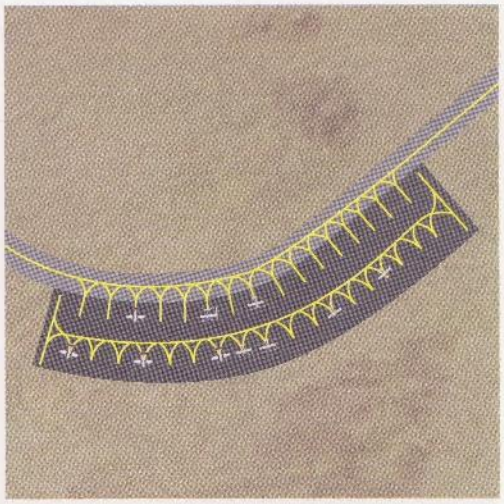


Figure 9.14 Apron markings.

AERODROME LIGHTING.

Light Signals are frequently used to pass information to pilots. Three colours are normally used: **red**, **green** and **white**.

Aerodrome Beacon.

An **aerodrome beacon** is provided for aerodromes intended for use at night in the following cases:

- Where information has to be passed to aircraft navigating predominantly by visual means.
- Where reduced visibilities are frequent.
- If it is difficult to locate the aerodrome due to surrounding lights or terrain.

Figure 9.15 Aerorome beacons flashing either white, or green and white.

An **aerodrome beacon** indicates the location of an aerodrome but does not inform a pilot of its identity.

Aerodrome beacons flash either white or alternating green and white.

Identification Beacon.

An identification beacon identifies the aerodrome by flashing a two letter Morse Code identifier every 12 seconds.

An **identification beacon** is used at aerodromes which are intended to be used at night and cannot easily be identified by other means.

- Green flashes indicate a civil aerodrome.

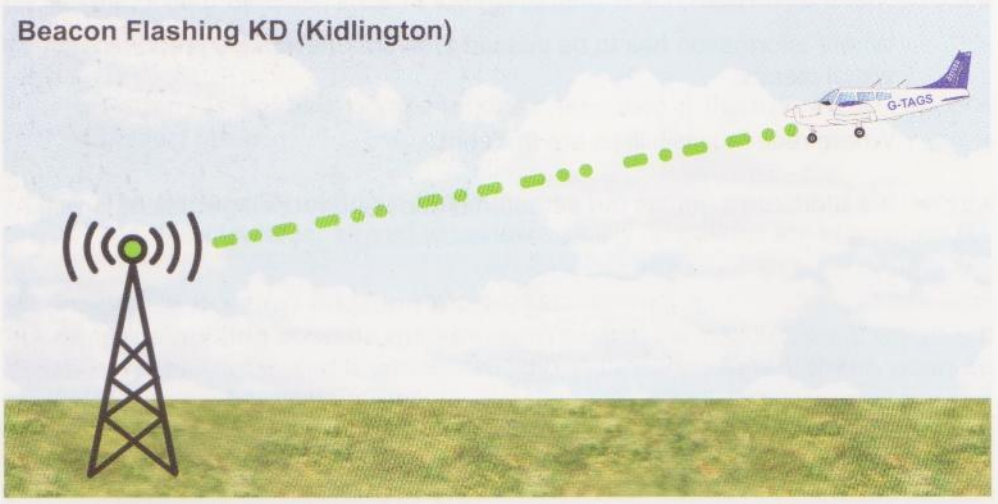


Figure 9.16 Civil Aerodrome - green flashes.

Military aerodrome identification beacons are red beacons flashing a 2-letter Morse Code identifier.

- Red flashes indicate a military aerodrome.

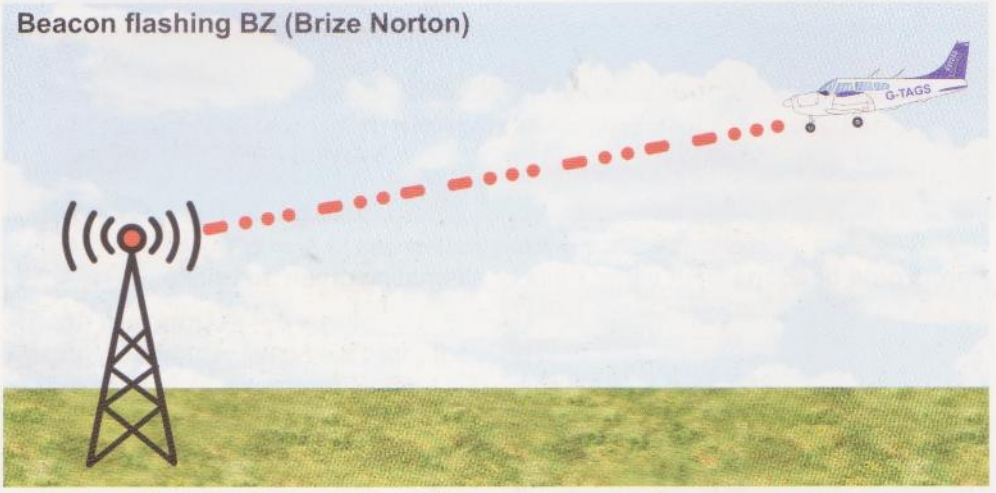


Figure 9.17 Military Aerodrome - red flashes.

Threshold Lighting.

Lights marking the **runway threshold** are fixed, unidirectional **GREEN** lights, showing in the direction of approach to the runway.

Runway End Lights.

The lights that indicate the end of the runway are fixed unidirectional **RED** lights.

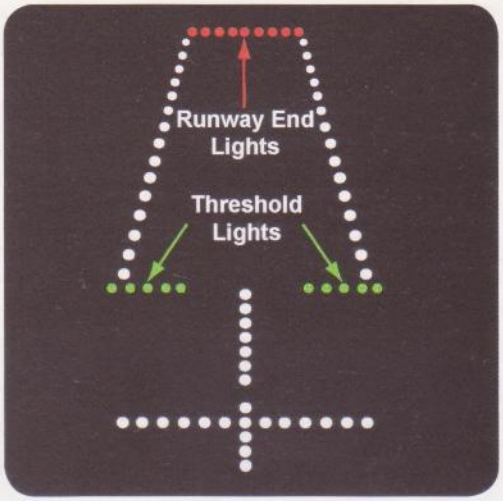


Figure 9.18 Threshold and End Lights.

Runway end lights are fixed unidirectional red lights, and threshold lights are fixed, unidirectional green lights, showing the direction of approach onto the runway.

Approach Slope Indicators.

Approach slope indicators help the pilot to establish his aircraft on a safe glideslope to land on the runway. The actual angle at which they are set is dependent on a number of factors (obstacles, topography, aerodrome layout etc.) but, normally, this angle is approximately 3° unless otherwise published. **Approach slope indicators** are permanent installations and tamper-free as far as it is possible. The three approach slope indicator systems that a Private Pilot may come across are:

- **Visual Approach Slope Indictor (VASI)**. Very few aerodromes in the UK still use this system, but it can still be found.
- **Precision Approach Path Indicator (PAPI)**.
- **Abbreviated Precision Approach Path Indicator (APAPI)**.

Visual Approach Slope Indictor (VASI).

VASIs do not show an immediate change from white to red (or vice versa) but will show a transitional pink before turning fully red. A **VASI** system is shown in *Figure 9.19*.

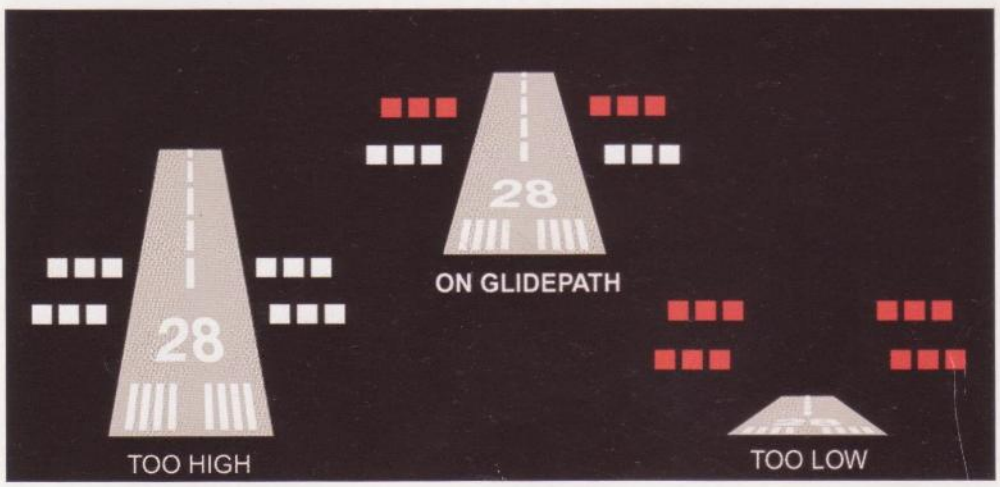


Figure 9.19 Visual Approach Slope Indicators, and their indications.

Precision Approach Path Indicator (PAPI).

- **PAPI** lights will turn immediately from red to white (and vice versa).
- When on the correct approach angle, the two lights closest to the runway will show red and the two furthest away will be white.
- The system of four lights will be located as a wing bar to the left of the runway threshold, but at large airports a PAPI set may be located either side of the runway.

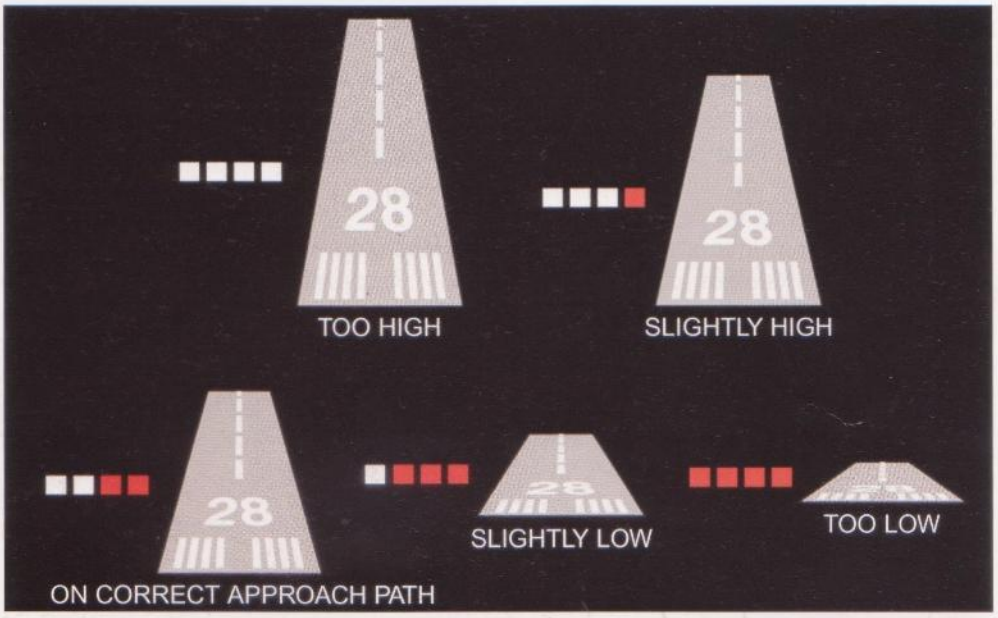


Figure 9.20 Precision Approach Path Indicators, and their indications.

Abbreviated Precision Approach Path Indicator (APAPI).

At smaller airfields, an abbreviated version of **PAPIs** may be found. With **Abbreviated PAPI**, instead of 4 lights, only 2 lights are used, as illustrated in *Figure 9.21*.

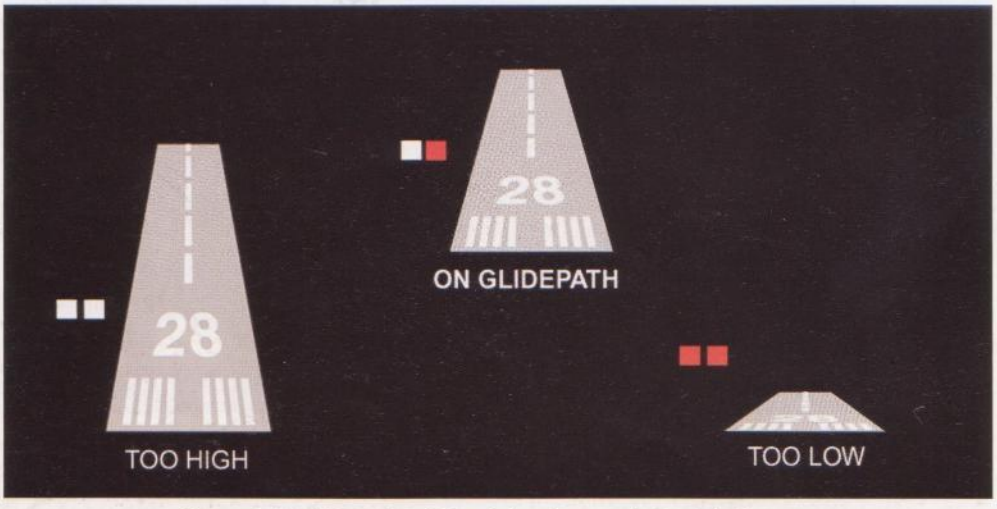


Figure 9.21 Abbreviated Precision Approach Path Indicators.

Runway Centre-Line and Edge Lights.

Runway centre-lights, which are installed at larger aerodromes, are colour coded to indicate runway distance remaining. **Runway edge lights** are white and are adjustable for brightness so that the pilot can ask ATC to increase or decrease the intensity.

Runway Approach Lights.

Runway approach lights are steady, unidirectional white lights, which can be adjusted for brightness, shining only in a narrow arc aligned with the approach. Runway approach lights normally consist of a centreline with a number of cross-bars. The centre-line extends from the threshold out to 500 metres, or 900 metres, and is designed to help the pilot line up with the runway centre-line. The cross-bars are designed to help the pilot orientate himself in the rolling plane, particularly as he regains visual contact with the runway, at the end of an instrument approach.

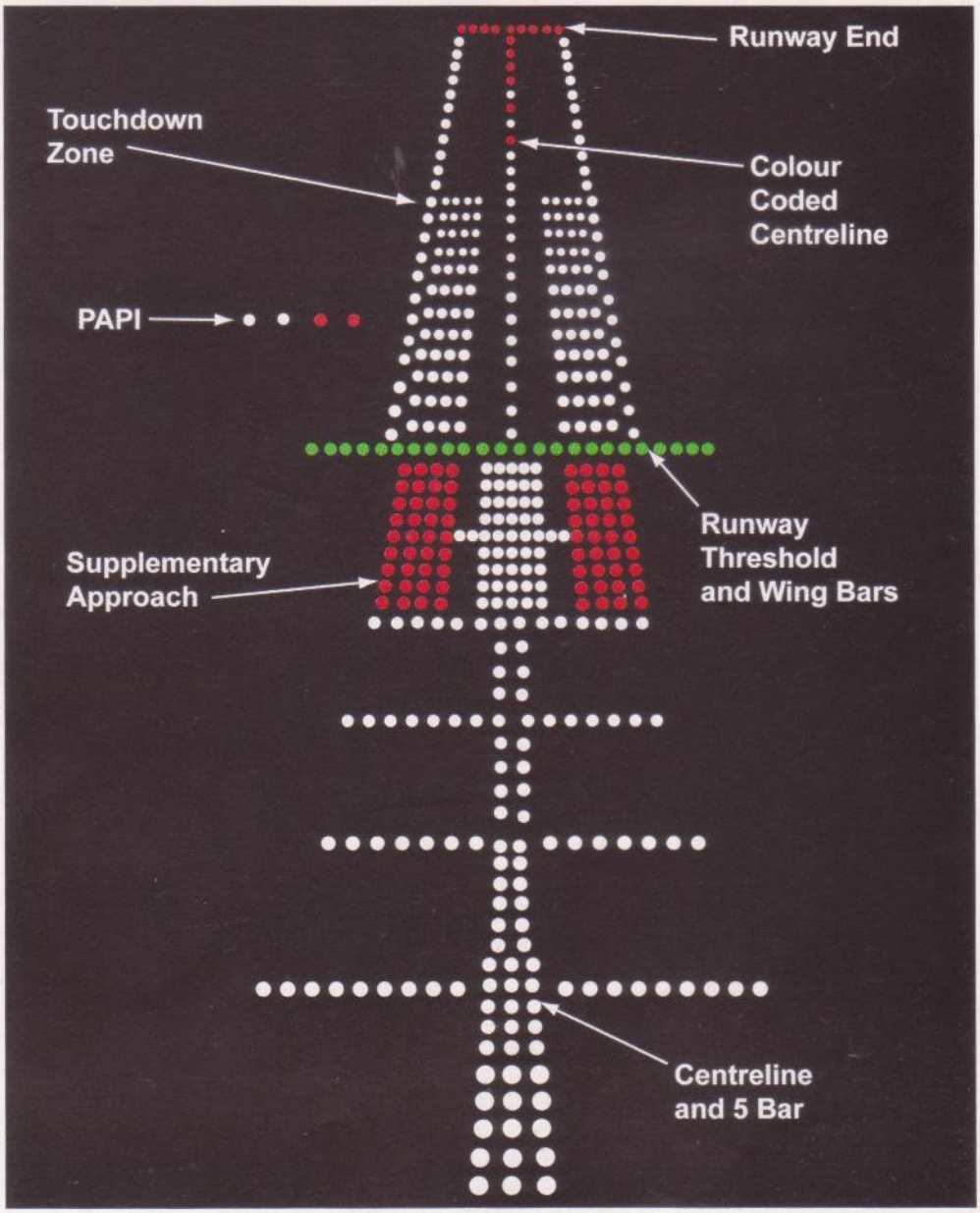


Figure 17.22 Lighting at a large aerodrome.

TAXIWAY LIGHTING.

Taxiway centre-line lights are steady green lights.

Taxiway Centre-Line Lights.

Taxiway centre-line lights are steady green lights.

Runway/Taxiway Exit Centre Lights.

You should note that "exit taxiway" centre lights, leading from a runway, are initially green and yellow, changing to all green within the taxiway.

Taxiway Edge Lights.

Taxiway edge or side lights are coloured blue.

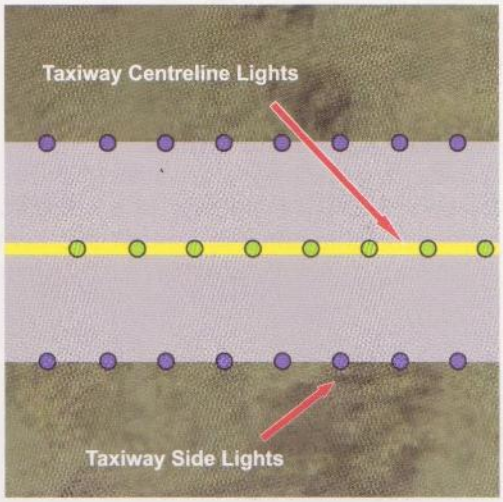


Figure 9.23 Taxiway Lights.

SIGNS.

General.

- All aerodrome signs are frangible. In other words, they are designed to break easily on impact.
- The only signs using the colour red are mandatory signs. Mandatory signs have a red background with the instruction superimposed in white lettering.
- All signs are retroflective or lit.
- The use of numbers alone on signs is reserved for runways.
- Location signs are depicted by yellow lettering on a black background, whereas destination signs have black lettering on a yellow background.

The following pages illustrate the most important aerodrome signs.

Mandatory Markings.

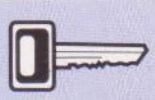
All **mandatory markings** consist of a white inscription on a red background. **Mandatory markings** normally mark lines which must not be passed without an ATC clearance. Examples of **mandatory markings** are:

- Runway holding position marking signs.
- Intermediate holding position signs.
- No entry signs.

Figure 9.24
No Entry Symbol (Top)
Holding Position.

Visual Runway Holding Position - denotes the visual Taxi-Holding Position and also the ILS CAT 1 Holding Position where the Visual and CAT 1 Holding Positions are co-located.

Mandatory aerodrome signs consist of white characters on a red background.



CAT 1/2 Runway Taxi-Holding Position Signs - denotes ILS CAT I/II Holding Position only where a visual Taxi-Holding Position is established closer to the runway in order to expedite traffic flow.

Intermediate Taxi-Holding Position Sign - marks a Holding Position established to protect a priority route.

No Entry Sign.

Note: You see above, figures referring to CAT I and CAT II. These signs refer to runways. Runways are categorised as CAT I, II or III according to the sophistication of the approach aids available.

Figure 9.25 Examples of Mandatory Airfield Signs.

Information, Location Signs and Destination Signs.

Location Signs.

Taxiway Location Sign identifying that the pilot is on taxiway A1.

Taxiway Ending Location Sign.

Runway Location Sign.

Figure 9.26a Examples of Airfield Location and Destination Signs.

Destination Signs.

Taxiway destination signs.

Runway destination sign.

Runway destination sign. Note the use of a hyphen to separate reciprocal designators.

Destination sign to different runways. Note the use of a dot to separate other designators.

Runway vacated sign.

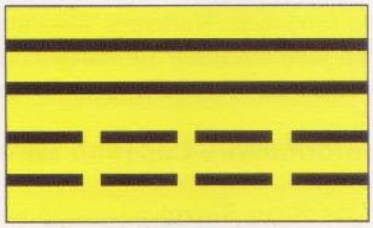


Figure 9.26b Airfield Information Signs.

MARKERS.

The most common markers on grass runways are **boundary markers. Boundary markers** are spaced at intervals along the boundary of the landing area.

Figure 9.27 Boundary Markers.

THE MARKING OF AERODROME OBSTACLES.

General.

An aerodrome obstacle is defined as any obstacle within 15 km of an aerodrome runway threshold.

- All obstacles on an aerodrome must either be marked (painted in a conspicuous colour/colours) or lit.
- Vehicles and other mobile objects are also considered to be obstacles and must be marked and lit.
- Aerodrome obstacles/obstructions are listed in the UK AIP (Aeronautical Information Publication), in the AD section.
- Instrument Approach and Landing charts also depict aerodrome obstacles.

Marking of Obstacles.

- All vehicles and moving objects must be coloured or must display flags.
- Normally, service vehicles are painted **yellow**. Emergency vehicles are most frequently coloured **red**, or, occasionally, **yellowish green**.
- Objects are painted either in a chequered pattern or in alternating bands of contrasting colours.

Lighting of Objects/Obstacles.

- Objects are usually lit as close to the top as possible.
- Obstacles may also be lit so as to indicate the edges of the obstacle.
- If an obstacle is over 45 m high, it may have a flashing red obstacle light at the highest points.

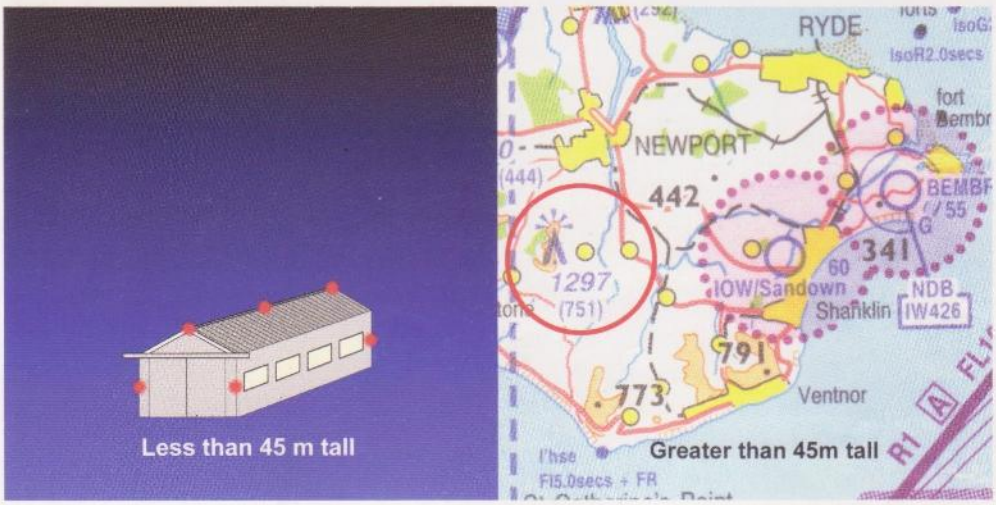
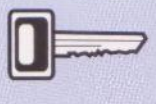


Figure 9.28 Obstacle Lights.

- In the UK, if obstacle lights fail on an obstacle with a height greater than 492 feet, the occurrence will be will be included in a NOTAM.

SIGNS FOR DENOTING AERODROME RESTRICTED USE AREAS.

Closed Runways.



A white cross on a runway indicates that it is closed. A closed taxiway is indicated by a yellow cross.

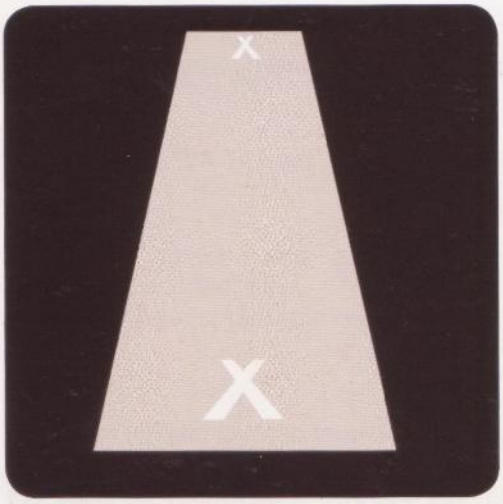


Figure 9.29 A Closed Runway.

Where a runway is permanently closed, a white X is placed at either end of the runway.

If only a section of the runway is closed, a white X is placed at the extremities of the closed section.

Closed Taxiways.

Where a taxiway is permanently closed, a yellow X is placed at either end of the taxiway. If only a section of the taxiway is closed, a yellow X is placed at the extremities of the closed section.

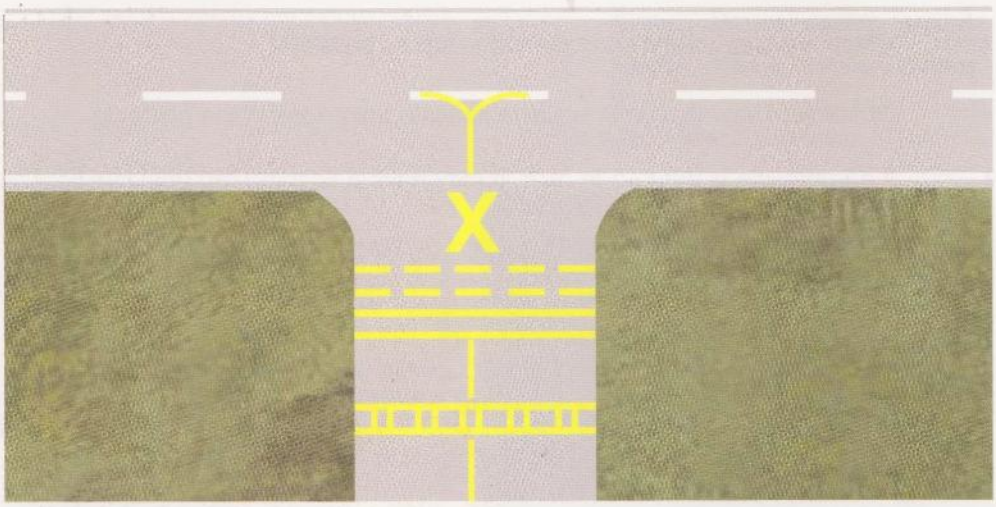


Figure 9.30 Closed Taxiway.

Temporarily Closed Runways or Taxiways.

If a runway or taxiway is closed temporarily, either breakable barriers are used or non-permanent surface markings to indicate this fact.

Other Markings.

When a runway or taxiway is permanently closed, all other normal runway and taxiway markings are obliterated.

Non-load Bearing Surfaces.

Where the surface is non-load bearing, yellow side stripes are used to delineate such an area, as depicted in *Figure 9.31*.

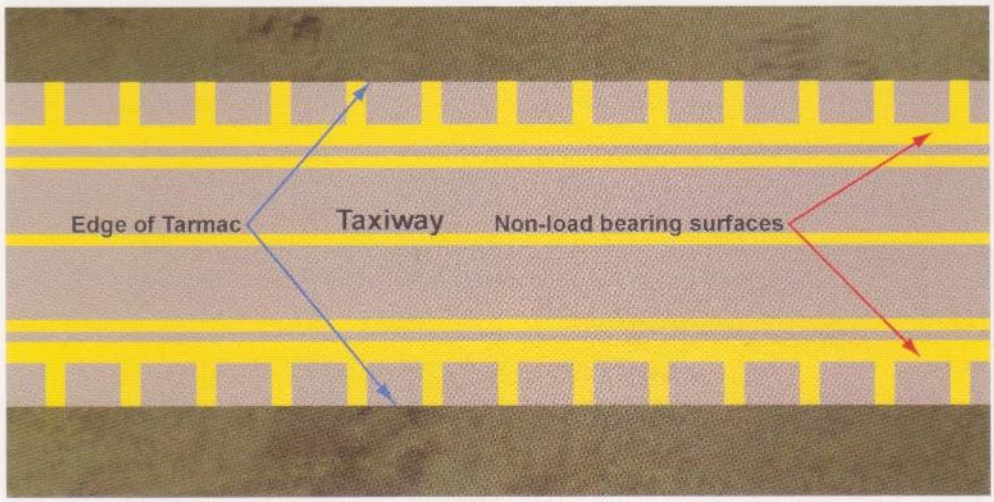


Figure 9.31 Non - Load Bearing Surfaces.

Other Unserviceable Areas.

Certain markers are used to indicate that an area is unserviceable, but that aircraft are still able to bypass it safely.

These can be:

- Markers (upstanding marker boards or cones), coloured **red and white or orange** and **white vertical** stripes. These markings will be in the form of vertical stripes, as shown in *Figure 9.32*.

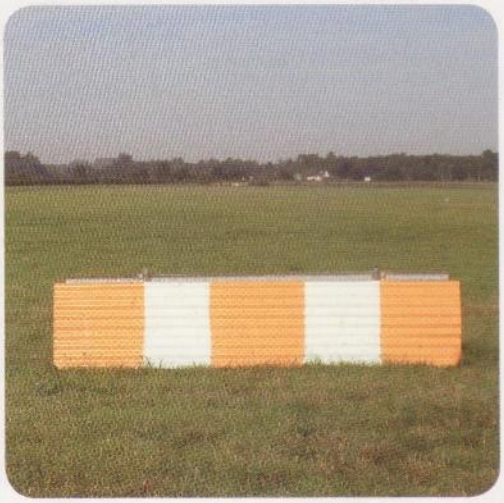


Figure 9.32 Marker Board.

- Marker lamps are normally low-intensity, steady red lights. These lamps are often called **glim lamps**.

Figure 9.33 Glim Lamp

- Cones marking unserviceable areas are normally coloured red, orange or yellow, or any one of these colours in combination with white.

Figure 9.34 Marker Cone

- Marker flags are normally coloured red, orange or yellow, or any one of these colours in combination with white.

Figure 9.35 Marker Flag

AERODROME EMERGENCY & OTHER SERVICES.

FIRE & RESCUE SERVICES.

General.

Rescue and fire-fighting services are provided at all large aerodromes. All aerodromes have rescue and fire-fighting equipment.

Figure 9.36 Emergency Services.

Aerodrome Fire Stations.

Large aerodromes normally have their own fire station; however, an off-aerodrome station may provide fire-cover if the prescribed response time can be met.

Figure 9.37 Fire Station at Kidlington, Oxon.

Response Time.

Emergency-service response time is considered to be the time between the initial call-out and the time when the first responding vehicle is in position to apply foam anywhere on the movement area.

All rescue and fire fighting units should be able to achieve a response time of **not exceeding 3 minutes.**

Figure 9.38 Fire vehicles ready to respond.

Level of Protection.

The number of rescue and fire fighting vehicles held at an aerodrome is based upon the longest aeroplane using that aerodrome and its fuselage width.

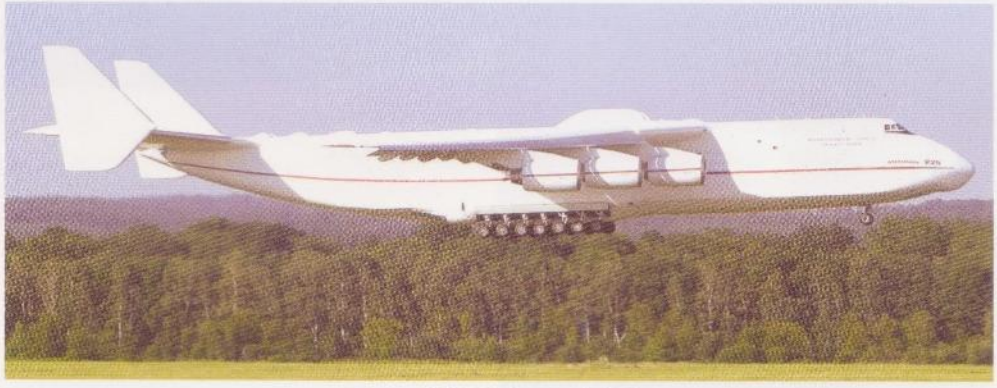


Figure 9.39 Antonov An225.

Apron Management Service.

The **apron management service** is a service for controlling and regulating vehicle and aircraft movements, safely from, to, and within the apron areas.

Figure 9.40 A busy apron.

Normally, **Aerodrome Control** (the tower) is responsible for **apron management service**, but large aerodromes may have a separate apron organisation, with its own frequency and dedicated manpower and facilities.

The following two points are noteworthy:

- An emergency vehicle responding to an emergency has priority over all other surface movements - including aircraft! Such a vehicle should be easily recognisable by its display of one or more flashing blue lights.

- On the apron, vehicles will give way to emergency vehicles and aircraft which are taxiing, about to taxi or being pushed or towed.

Representative PPL - type questions to test your theoretical knowledge of Aerodromes (General).

1. What colour are the markings on runways?

   a. Yellow
   b. Green
   c. Yellow or white
   d. White

2. What is the colour of the markings on taxiways?

   a. Yellow
   b. Green
   c. Yellow or white
   d. White

3. What is the definition of a "damp" runway?

   a. The surface is soaked but there is no standing water
   b. The runway has a shiny appearance due to the moisture
   c. The surface shows a change of colour due to the moisture
   d. The runway is affected by moisture but it is safe for landing operations

4. A hand-held signalling lamp is to be held in Control Towers. What colours must it be capable of signalling?

   a. White or red only
   b. White, red or green
   c. Green or red only
   d. White, red, green or blue

5. An aerodrome has no Signals Area. What does this imply?

   a. It has no significance. Aerodromes may or may not have a Signals Area and the choice as to whether to have one or not is that of the owner of the Aerodrome
   b. Except in an emergency no non-radio aircraft will be accepted
   c. The aerodrome can only be used by day
   d. Only IFR traffic is accepted

6. What is the basic marking for a displaced threshold?

   a. A yellow chevron marking at the end of the runway
   b. Two white arrows at the end of the runway
   c. A white transverse stripe
   d. A single white arrow at the end of the runway

7. Which holding position is closest to the runway?

   a. Pattern 'A'
   b. Pattern 'B'
   c. Pattern 'C'
   d. Can be any of the above depending on the length of the runway

8. What colours indicate mandatory markings and signs?

   a. Yellow lettering on a black background
   b. Black lettering on a yellow background
   c. Red lettering on a white background
   d. White lettering on a red background

9. An Aerodrome Beacon flashes in what colour(s)?

   a. Green
   b. White
   c. Red
   d. White or green and white

10. What colour are threshold lights?

    a. Red
    b. Green
    c. Green threshold lights and red end lights
    d. Red and green

11. What colour are taxiway side lights?

    a. Red
    b. Green
    c. White
    d. Blue

12. What colour are taxiway centreline lights?

    a. Yellow
    b. Green
    c. Red
    d. Blue

13. How is a Location Sign depicted?

    a. Yellow lettering on a black background
    b. Black lettering on a yellow background
    c. Red lettering on a white background
    d. White lettering on a red background

14. How is a closed runway indicated?

a. White cross
b. Yellow cross
c. With the use of barriers
d. The word "CLOSED" in white

15. How is a non-load bearing surface to the side of a taxiway depicted?

a. A white side stripe
b. Yellow side stripes
c. A yellow or white side stripe
d. A yellow and white side stripe

16. What is the Response Time for Fire and Rescue?

a. Not exceeding 1 minute
b. Not exceeding 2 minutes
c. Not exceeding 3 minutes
d. Not exceeding 5 minutes

17. An emergency vehicle responding to an emergency will display what colour flashing light?

a. White
b. Green
c. Yellow
d. Blue

18. An emergency vehicle responding to an emergency has priority over:

a. All vehicles
b. All aircraft only
c. All surface movements
d. It has no special priority

19. All aerodromes must have:

a. At least 2 windsocks
b. At least 1 windsock
c. At least 1 windsock and a Landing 'T'
d. At least 2 windsocks and a Landing 'T'

20. Runway approach lights are:

a. White and can be adjusted for brightness
b. White and cannot be adjusted for brightness
c. Red and can be adjusted
d. Red and cannot be adjusted

21. Runway side lights are:

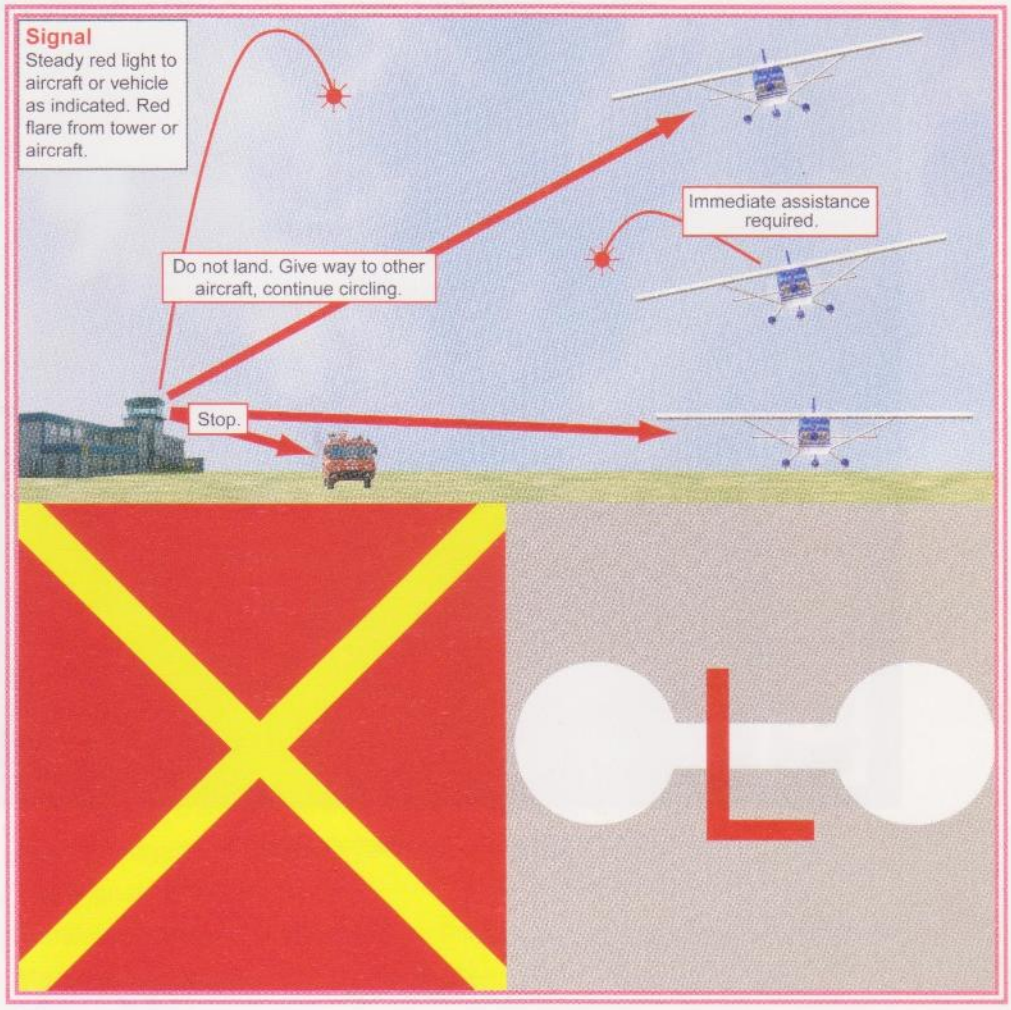
a. Green
b. White
c. Blue
d. Red

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer												

Question	13	14	15	16	17	18	19	20	21
Answer									

The answers to these questions can be found at the end of this book.

ANNEX A
GENERAL LIGHTS AND SIGNALS



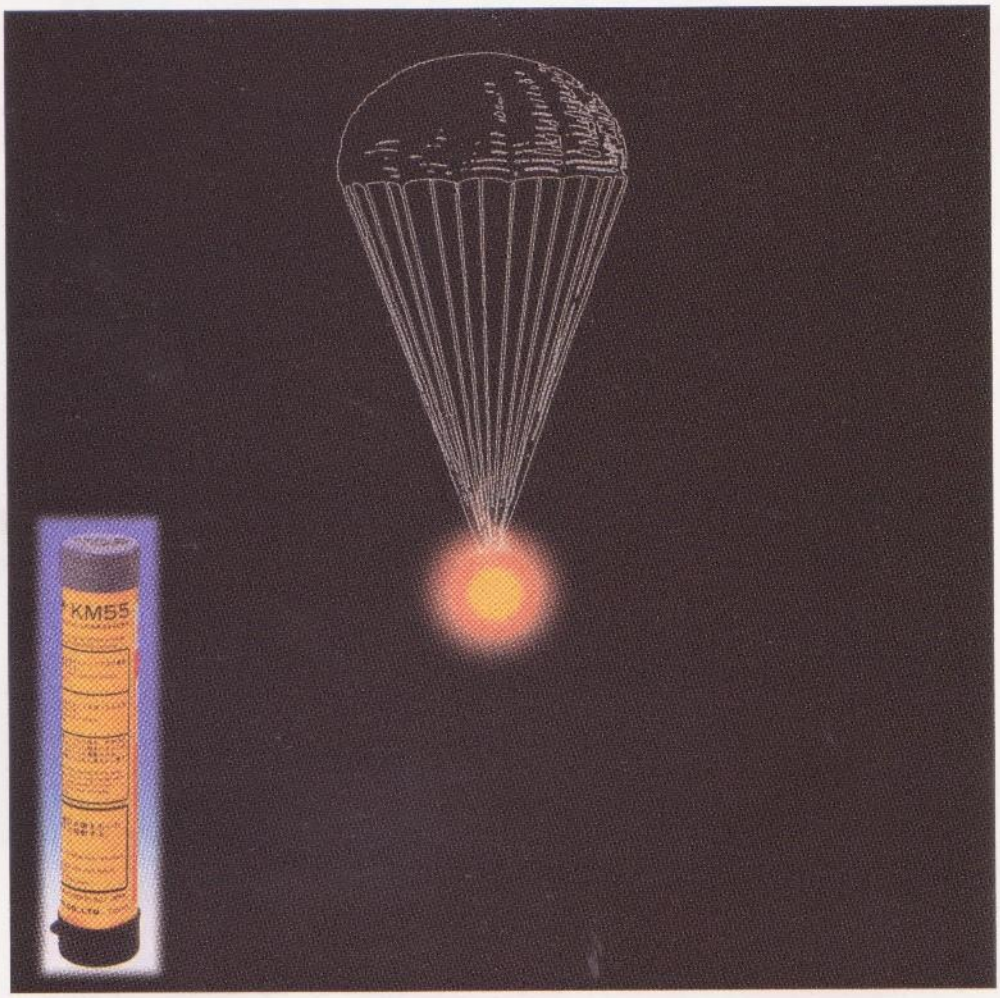


Figure A-1 A Parachute Flare.

INTRODUCTION.

Even when flown for recreation and/or sport, most aircraft today, however basic their instrument fit, carry radios. Radiotelephony is, of course, by far the most efficient method for aircraft and Air Traffic Service Units to communicate between themselves. Indeed, for several decades past, most large aerodromes and airfields have insisted that aircraft operating into or out of them be equipped with standard VHF radios.

Questions may be asked on any of the lights and signals in this Chapter. All must be known.

Nowadays, then, it is routine for a pilot to obtain information and instructions for the safe conduct of his flight over the radio. Consequently, if a pilot suffers radio failure, he is likely immediately to find himself hindered in the progress of his flight. If either he or his aircraft is in trouble, the absence of radio may make the situation extremely critical.

It is, therefore, vitally important for the pilot to be able to understand the various forms and meanings of the signals that may be made by Air Traffic Control Services, or for that matter by anyone else, for the attention of aircraft. The pilot may also need to signal to people on the ground concerning his own situation and/or intentions.

It is the aim of this Annex to describe the different type of signals that are used for air-ground and ground-air communications. For the most part, the signals are visual signals in the form of lights or pictograms. Distress messages passed by Radiotelephony are dealt with fully in Volume 7 of this series: **'Radiotelephony'**.

Signals will be presented in this Annex which cover the following situations:

- Distress & Urgency Signals.
- Signals For Use in the Event of Interception.
- Signals Pertinent to Restricted, Prohibited and Danger Areas.
- Light Signals Between Aircraft and Air Traffic Service Units.
- Acknowledgement Signals by Aircraft in the Air.
- The Signals Square.
- Marshalling Signals – Marshaller to Pilot.
- Marshalling Signals – Pilot to Marshaller.

DISTRESS & URGENCY.

When an aircraft which is airborne is in distress or urgency, the situation is tense and a pilot often needs to think primarily about flying the aircraft. If he is also experiencing radio failure, the situation is made even more critical.

The following methods of signalling distress and urgency may seem to be desperate measures and, in the case of pyrotechnics and flares, to offer a highly impractical solution to the light aircraft pilot. However, a pilot who can signal an emergency to the ground by any means whatsoever may just manage to create the conditions which prevent disaster. Therefore, the following signals are included in this Annex.

Of course, a pilot may be on the ground when he needs to make a distress or urgency signal; or else someone on the ground may wish to signal to an aircraft. In this case, a difficult situation is made slightly easier.

Even if the radio is working, it is desirable, in an emergency, that the pilot should express his predicament, at least partially, in a simple-to-understand code which is unable to be misinterpreted. And, of course, the pilot's top priority in an emergency situation is to fly the aircraft, not to worry about the words he is using on the radio.

Distress Signals.

The following signals, used either together or separately, mean that **grave and imminent danger** threatens, and **immediate assistance** is requested:

- Visually signalling, or signalling by any other method, the letters SOS in the Morse Code (. . . — — — . . .).
- A series of red pyrotechnic lights, fired one at a time at short intervals.
- A parachute flare showing a red light *(see Figure A-1, page 344).*
- If the pilot is able to fly a pattern which would be identified by a ground radar station, he should fly equilateral triangles to the left and watch out for the arrival of a shepherd aircraft (*see Figure A-2*).

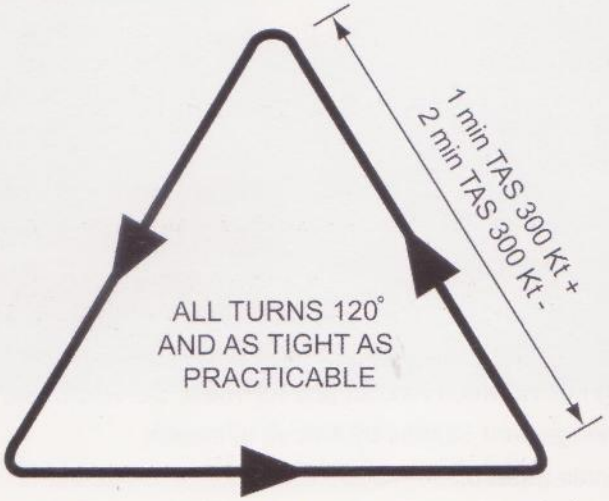


Figure A-2 Distress - if you are able to fly a pattern, fly equilateral triangles to the left.

- If your radio has failed, but you suspect that the radio's carrier wave is still transmitting, signal the letters SOS with your microphone switch.
- Select the SSR Code 7700 on your transponder

Urgency Signals.

The following signals, used either together or separately, mean that an aircraft wishes to give notice of **difficulties which compel it to land**, without requiring immediate assistance:

- The repeated switching on and off of the landing lights.
- The repeated switching on and off of the navigation lights in such a manner as to be distinct from flashing navigation lights.
- In order to indicate an urgency situation regarding your own aircraft or regarding another vessel, vehicle or aircraft, signal the letters XXX (— . . — . . — . .) with your landing lights.

Ground-Air Signals for use by Survivors of a Downed Aircraft.

Ground to air signals for use by survivors of a downed aircraft, or for use by rescue teams, may be constructed by any means available. These signals are depicted below. The minimum length of the arms of a signal should be 8 feet (2.5 metres).

Ground - air visual signal code for use by survivors	
	**Require Assistance**
	**Require Medical Assistance**
	**No or Negative**
	**Yes or Affirmative**
	**Proceeding in this direction**

Figure A-3 Distress Signals - Ground to Air, for use by survivors.

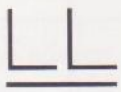
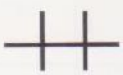
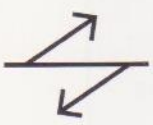
Ground - air visual signal code for use by rescue teams	
	**Operation completed**
	**We have found all personnel**
	**We have found only some personnel**
	**We are not able to continue. Returning to base.**
	**We have divided into two groups. Each proceeding in the direction indicated.**
	**Information received that aircraft is in this direction.**
	**Nothing found. Will continue search.**

Figure A-4 Distress Signals - Ground to Air, for use by rescue teams.

SIGNALS FOR USE IN THE EVENT OF INTERCEPTION.

Introduction.

The United Kingdom Air Navigation Order stipulates that on international flights all aircraft must carry a copy of **'Signals for Use in the Event of Interception'**. These are detailed in the **UK AIP ENR 1– 12**.

The table below summarises the signals and procedures to be used, but the important point is that the law requires the pilot to carry the appropriate documentation with him.

The reason why a pilot needs to know these interception signals when flying internationally is that each ICAO contracting state reserves the right, for reasons of military necessity or public safety, to restrict or prohibit the aircraft from other states from flying over certain areas of its territory. A state may , therefore, wish to investigate the identity of aircraft and perhaps lead the intercepted aircraft away from a particular area or require it to land at a particular aerodrome.

Signals Initiated by Intercepting Aircraft and Responses by Intercepted Aircraft.

INTERCEPTING Aircraft Signals	Meaning	INTERCEPTED Aircraft Responds	Meaning
1. DAY or NIGHT Rocking aircraft and flashing navigation lights at irregular intervals (and landing lights in the case of a helicopter) from a position slightly above and ahead of, and normally to the left of, the intercepted aircraft (or to the right if the intercepted aircraft is a helicopter) and, after acknowledgement, a slow level turn, normally to the left, (or to the right in the case of a helicopter) onto the desired heading.	You have been intercepted. Follow me.	**DAY or NIGHT** Rocking aircraft, flashing navigation lights at irregular intervals and following.	Understood, will comply.
2. DAY or NIGHT An abrupt break-away manoeuvre from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.	You may proceed.	**DAY or NIGHT** Rocking the aircraft.	Understood, will comply.
3. DAY or NIGHT Lowering landing gear (if fitted), showing steady landing lights and over-flying runway in use or, if the intercepted aircraft is a helicopter, over-flying the helicopter landing area. In the case of helicopters, the intercepting helicopter makes a landing approach, coming to hover near to the landing area.	Land at this aerodrome.	**DAY or NIGHT** Lowering landing gear, (if fitted), showing steady landing lights and following the intercepting aircraft and, if, after over-flying the runway in use or helicopter landing area, landing is considered safe, proceeding to land.	Understood, will comply.

Signals Initiated by the Intercepted Aircraft and Responses by Intercepting Aircraft.

INTERCEPTED Aircraft Signals	Meaning	INTERCEPTING Aircraft Responds	Meaning
4. DAY or NIGHT Raising landing gear (if fitted) and flashing landing lights while passing over runway in use, or helicopter landing area, at a height exceeding 300 m (1 000 ft) but not exceeding 600 m (2 000 ft) (in the case of a helicopter, at a height exceeding 50 m (170 ft) but not exceeding 100 m (330 ft)) above the aerodrome level, and continuing to circle runway in use or helicopter landing area. If unable to flash landing lights, flash any other lights available.	aerodrome you have designated is inadequate.	**DAY or NIGHT** If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate aerodrome, the intercepting aircraft raises its landing gear (if fitted) and uses the Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood, follow me. Understood, you may proceed.
5. DAY or NIGHT Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply	**DAY or NIGHT** Use Series 2 signals prescribed for intercepting aircraft.	Understood.
6. DAY or NIGHT Irregular flashing of all available lights.	In distress.	**DAY or NIGHT** Use Series 2 signals prescribed for intercepting aircraft.	Understood.

SIGNALS FROM RESTRICTED, PROHIBITED OR DANGER AREAS.

By day and by night, a series of projectiles discharged from the ground at intervals of 10 seconds, each showing, on bursting, red and green lights or stars will indicate to an unauthorized aircraft that it is flying in, or about to enter, a **restricted**, **prohibited** or **danger area**, and that the aircraft is to take such remedial action as may be necessary.

LIGHT SIGNALS BETWEEN AIRCRAFT AND AIR TRAFFIC SERVICE UNITS.

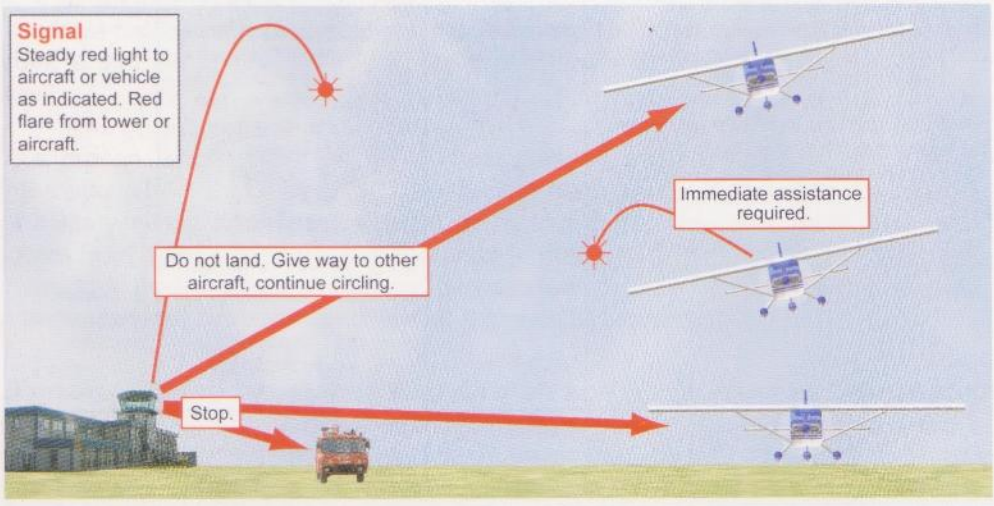
The following signals may be made between an Air Traffic Services Unit (ATSU) and aircraft in the air or on the ground. The meaning of signals between an ATSU and vehicles on the aerodrome is also given.

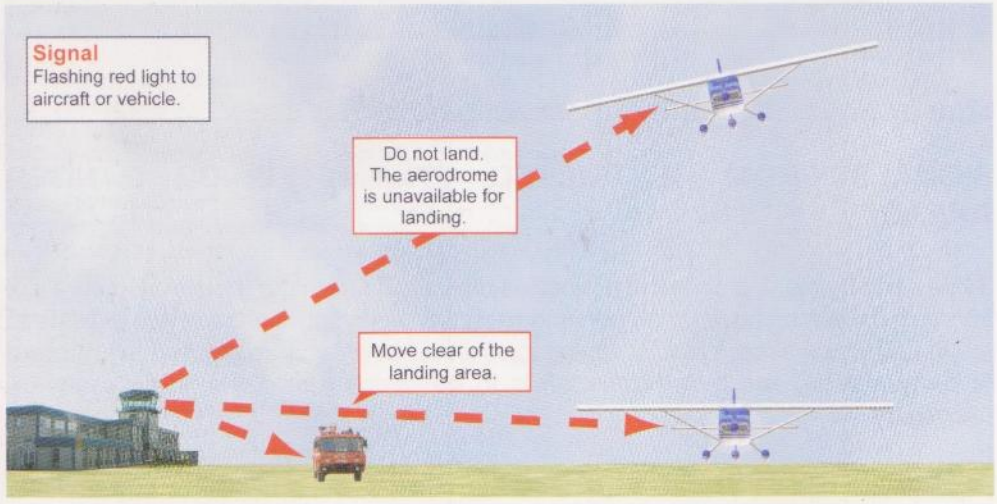
A continuous red light directed from the tower to an aircraft in flight means "Give way to other aircraft and continue circling".

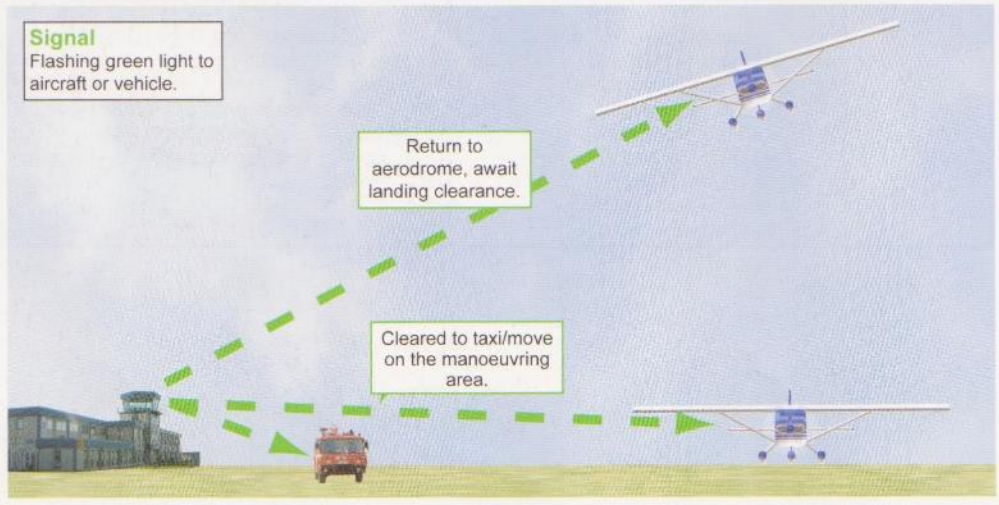
A continuous red light directed from the tower to an aircraft or vehicle on the ground means "stop".

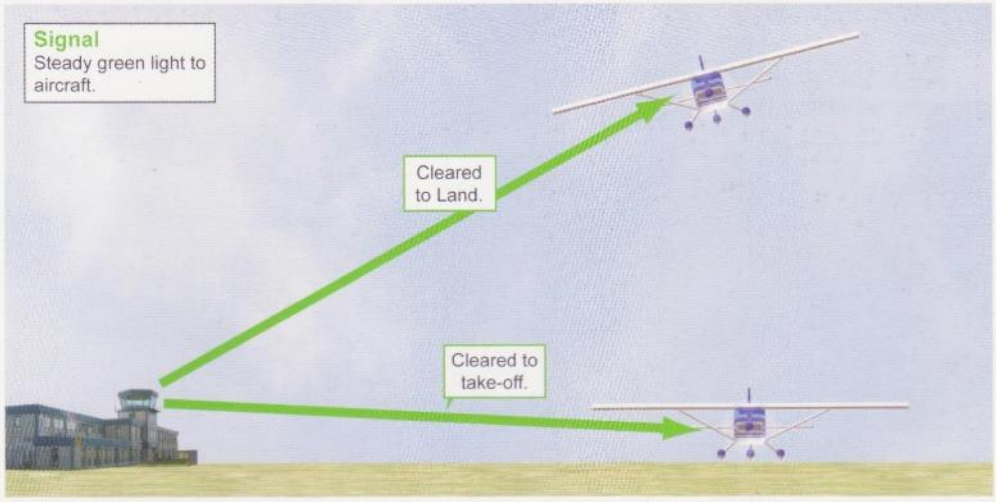
A flashing red light directed from the tower to an aircraft in flight means "Do not land. the aerodrome is unavailable for landing".

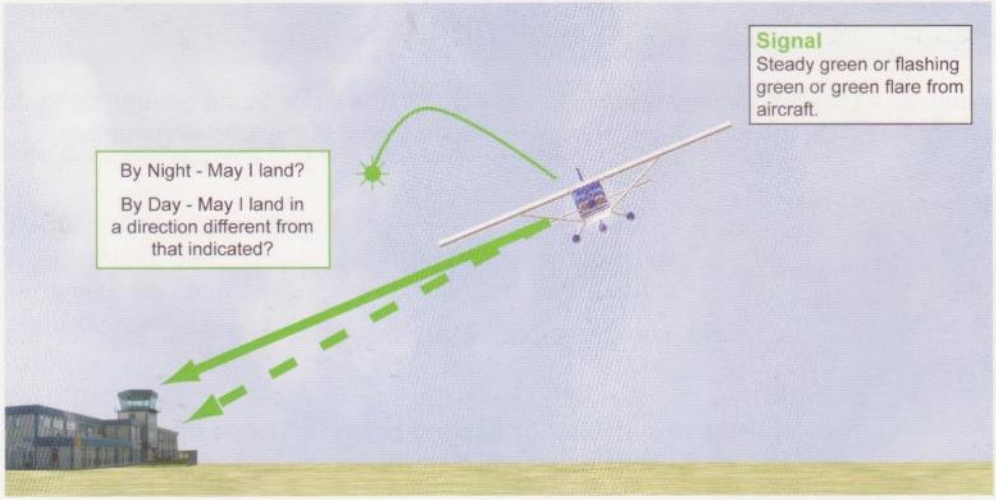
A flashing red light directed from the tower to an aircraft on the ground means "Move clear of the landing area".

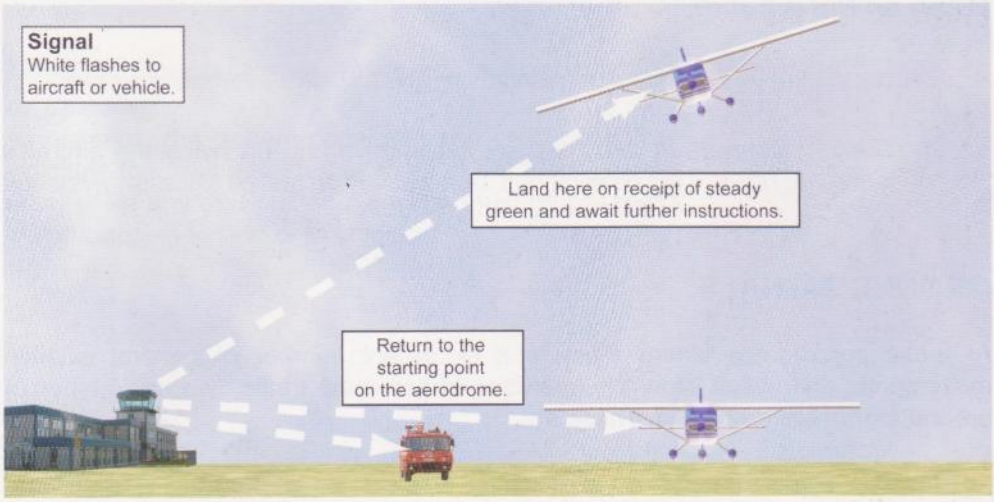






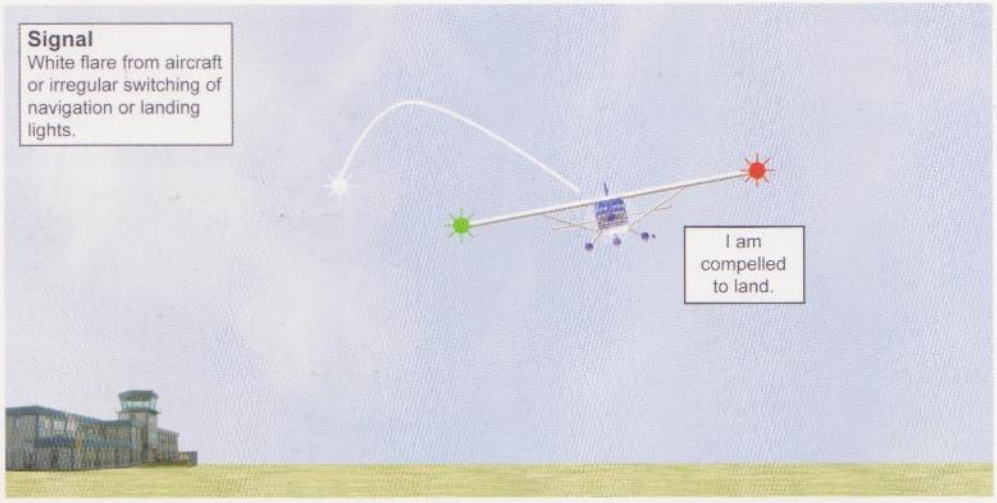






A series of white flashes from the tower to an aircraft in flight means "Land at this aerodrome after receiving a continuous green light, and await further instructions".

A series of white flashes from the tower to an aircraft on the ground means "Return to the starting point on the aerodrome".



ACKNOWLEDGEMENT BY AN AIRCRAFT.

When an ATSU has passed a signal to an aircraft in the air or on the ground, by lights or pyrotechnics, the aircraft will acknowledge the signal in the following manner.

When in flight:

- During the hours of daylight: by rocking the aircraft's wings.

(**NB:** This signal should not be expected on the base and final legs of the approach.)

- During the hours of darkness: by flashing on and off **twice** the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.

When on the ground:

- During the hours of daylight: by moving the aircraft's ailerons or rudder.

- During the hours of darkness: by flashing on and off **twice** the aircraft's landing lights or, if not so equipped, by switching on and off twice its navigation lights.

GROUND SIGNALS.

At those aerodromes where there is a significant number of general aviation movements, and which allow the operation of non-radio traffic, two basic types of ground **signal** are employed. These are:

- **The Signals Square**.

- **A Signal Mast**.

THE SIGNALS SQUARE.

Where provided, the **Signals Square** is 12 metres square and bounded by a white border. **The Signals Square** is located in a position from which it can be seen by aircraft joining the circuit. (*See Figure A-5*).

Figure A-5 A Signals Square located near the tower.

The signals displayed in the signals square include the following:

Prohibition of Landing.

A horizontal, red, square panel with yellow diagonal lines indicates that landings are prohibited and that the prohibition is liable to be prolonged.

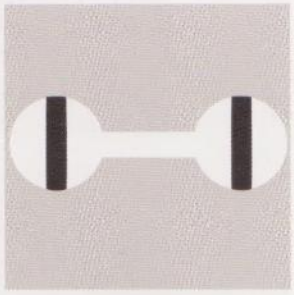
Need for Special Precautions while Approaching or Landing.

A horizontal, red, square panel with one yellow diagonal indicates that owing to the bad state of the manoeuvring area, or for any other reason, caution must be observed in approaching to land or in landing.

Use of Runways and Taxiways.

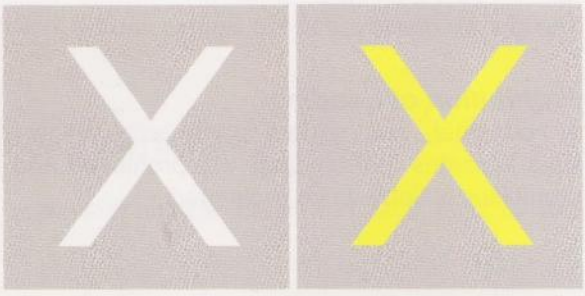
A horizontal white dumb-bell when displayed in a Signals Square indicates that aircraft are required to land, take off and taxi on runways and taxiways only.

A horizontal white dumb-bell, with a black bar placed perpendicular to the shaft across each circular portion of the dumb-bell, indicates that aircraft are required to land and take off on runways only, but other manoeuvres need not be confined to runways and taxiways.



Closed Runways or Taxiways.

Crosses of a single contrasting colour, yellow (taxiways) or white (runways), displayed horizontally on runways and taxiways, or parts thereof, indicate an area unfit for the movement of aircraft.



Directions for Landing or Take-off.

A horizontal white or orange landing **T** indicates the direction to be used by aircraft for landing and take-off, which shall be in a direction parallel to the shaft of the **T** towards the cross arm.

Note: When used at night, the landing **T** is either illuminated or outlined in white coloured lights.

A white disc displayed alongside the cross arm of the **T** signifies that the directions of take-off and landing do not necessarily coincide.

This signal displayed on the Signals Square has the same meaning as a single black ball hoisted on a mast.

A set of two digits displayed vertically at or near the aerodrome control tower indicates to aircraft on the manoeuvring area the runway in use. Normally, the lettering is black on a yellow background. This signal indicates that Runway 12 is in use.

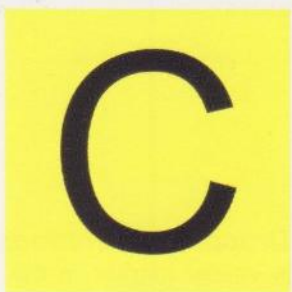
Right-Hand Traffic.

When displayed in a Signals Square, or horizontally at the end of the runway or strip in use, a right-hand arrow of conspicuous colour (normally yellow and red stripes) indicates that a right-hand circuit is in force and that turns are to be made to the right before landing and after take-off.

This signal displayed on the Signals Square has the same meaning as a green flag hoisted on a mast.

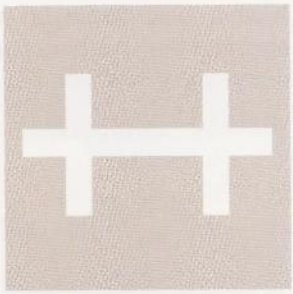
Air Traffic Services Reporting Office.

The letter **C** displayed vertically in black against a yellow background indicates the location of the **A**ir **T**raffic **S**ervices reporting office.



This signal located in the Signals Square has the same meaning as two red balls hoisted on a mast.

Glider Flights in Operation.
A double white cross displayed horizontally indicates that the aerodrome is being used by gliders and that glider flying is in progress.



Helicopter Operations.
A large white **H** signifies that helicopters shall take off and land within the area designated by the letter **H**, and that the area is to be used for take-off and launching of helicopters only.

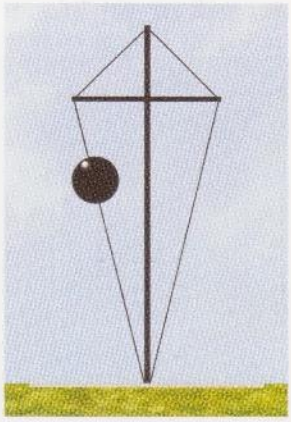
Light Aircraft Operations.
A red **L** displayed on a white dumb-bell signifies that light aircraft are permitted to take off and land either on a runway or on the area designated, usually a grass area marked with a large white letter **L** (see below).

Area Reserved for Take-Off and Landing of Light Aircraft.
A large white **L** may be located on a part of the manoeuvring area to be used only for the take-off and landing of light aircraft.

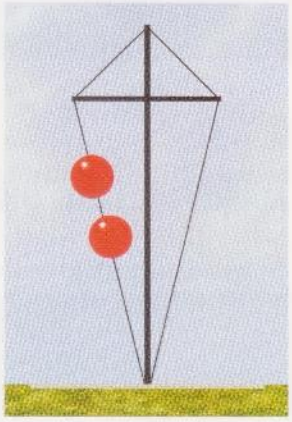
Dropping Operations.
A yellow marker in the shape of a St. George's cross indicates an area reserved for the dropping of tow ropes or similar articles.

SIGNALS DISPLAYED ON THE SIGNALS MAST.

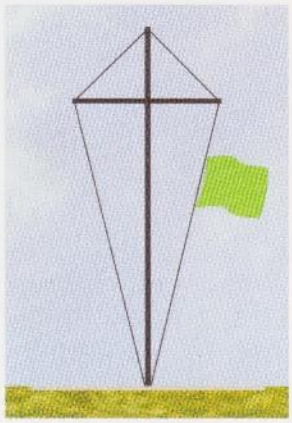
A Single Black Ball.
A single black ball hoisted on a mast, as shown, indicates that the directions for take-off and landing are not necessarily the same.



Two Red Balls.
Two red balls signify that glider flying is in progress at the aerodrome.



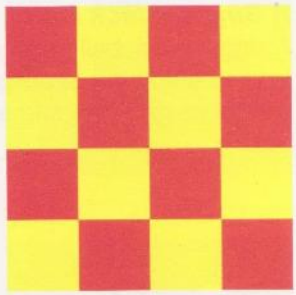
A Rectangular Green Flag.
Indicates that a right-hand circuit is in force.



MISCELLANEOUS SIGNS.

Taxi According to ATC Instructions.

A panel or flag made up of red and yellow squares indicates that aircraft may taxi only in accordance with ATC instructions. If it is a flag, it is flown on the signals mast. If it is the form of a panel, it is displayed and located on the Control Tower.



Boundaries.

Orange and white striped markers are used to delineate the boundary of an airfield where the natural boundary is insufficiently conspicuous.

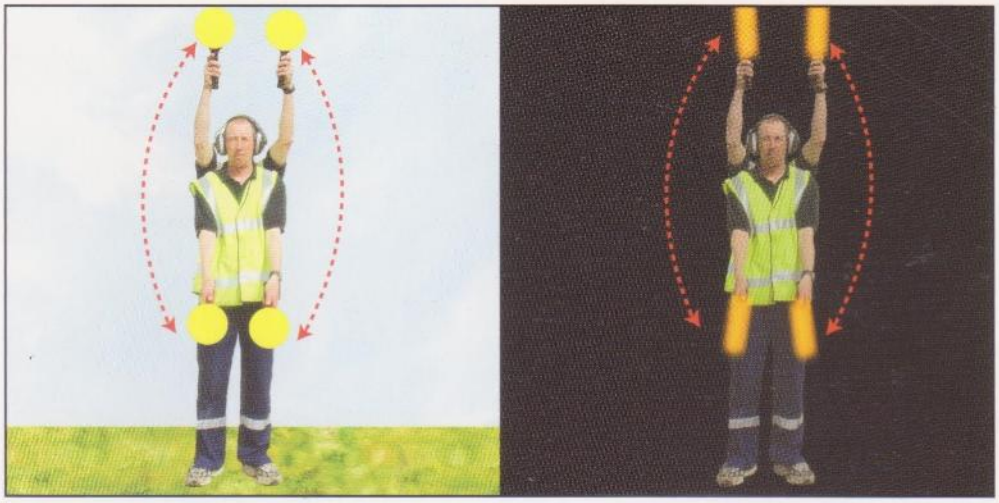
MARSHALLING SIGNALS - MARSHALLER TO PILOT.

To assist aircraft to manoeuvre on the ground, especially on the apron, a standard system of signals has been developed for use between an aircraft marshaller and the pilot. These signals are shown here. The marshaller uses a high-visibility bat during the day (or he may signal without a bat), and illuminated batons after dark.

"Proceed under guidance of another marshaller."

Right or left arm down, the other arm moved across the body and extended to indicate the position of the other marshaller.

"Move ahead."
Arms repeatedly moved upwards and backwards from shoulder height, beckoning onward.



"Open up starboard engine" or "turn to port."
Right arm down, the left arm repeatedly moved upwards and backwards. The speed of the arm movement indicates the rate of turn.

"Open up port engine" or "turn to starboard."
Left arm down, the right arm repeatedly moved upwards and backwards. The speed of the arm movement indicates the rate of turn.

"Stop."
Arms repeatedly crossed above the head. The speed of the arm movement indicates the urgency to stop.

"Start engine."

- A circular motion of the right hand at head level, with the left arm pointing to the appropriate engine.

Left hand over head with the number of fingers extended, to indicate the number of the engine to be started and circular motion of right hand at head level.

Numbering of Aircraft Engines
Note: *The engines of multi-engined aircraft are numbered, with the marshaller facing the aircraft, from right to left (i.e. No.1 engine being the port outer engine).*

"Chocks inserted."
Arms extended, the palms facing inwards, then swung from the extended position inwards.

"Chocks away."
Arms down, the palms facing outwards, then swung outwards.

"Cut engine(s)."
Either arm and hand placed level with the chest, then moved laterally with the palms downwards.

"Slow down."
Arms placed down, with the palms towards the ground, then moved up and down several times.

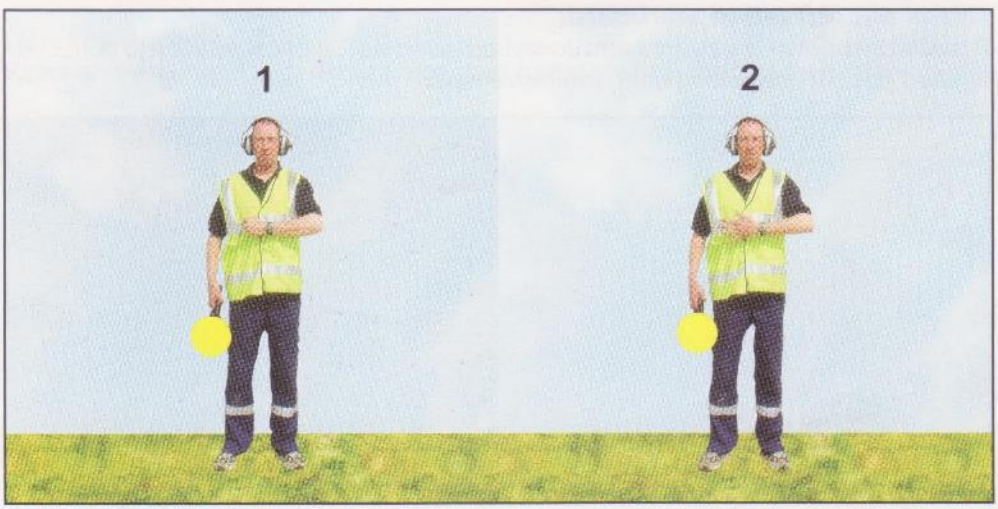
"Slow down engine(s) on side indicated by moving arm."
Arms placed down, with palms towards the ground, then appropriate arm moved up and down several times.

"This bay."
Arms placed above the head in a vertical position.

"All clear – marshalling finished."
The right arm raised at the elbow, with the palm facing forward.

Note: Sometimes this meaning is indicated by the right arm raised at the elbow with thumb erect.

"Release brakes."
Raise arm with fist clenched, horizontally in front of body, then extend fingers.



"Engage brakes."
Raise arm and hand with fingers extended, horizontally in front of body, then clench fist.

ALL AIRCRAFT EXCEPT HELICOPTERS.

"Back aircraft tail to starboard."
Point left arm down, move right arm down from overhead, vertical position to horizontal forward position, repeating right arm movement.

"Back aircraft tail to port."
Point right arm down, move left arm down from overhead, vertical position to horizontal forward position, repeating left arm movement.

PILOT TO MARSHALLER.

"Brakes engaged."
Raise arm and hand with fingers extended horizontally in front of face, then clench fist.

"Brakes released."
Raise arm and hand with fist clenched horizontally in front of face, then extend fingers.

"Insert chocks."
Arms extended palms facing outwards, move hands inwards to cross in front of face.

"Remove chocks."

Hands crossed in front of face, palms facing outwards, move arms outwards.

"Ready to start engine indicated."

Raise the number of fingers on one hand indicating the number of the engine to be started.

Representative PPL - type questions to test your theoretical knowledge of Flight and Ground Limitations.

1. What is the meaning of a continuous red light directed from the tower to an aircraft in flight?

   a. Return to the aerodrome.
   b. Land immediately.
   c. Do not land. Airfield unavailable for landing.
   d. Give way to other aircraft and continue circling.

2. What is the meaning of a series of white flashes directed at an aircraft in flight or on the ground?

	In Flight	On the Ground
a.	Do not land, the airfield is unavailable for landing.	Move clear of the landing area.
b.	Give way to other aircraft. Continue circling.	Stop.
c.	Land at this aerodrome after receiving a continuous green and await further instructions.	Return to the starting point on the aerodrome.
d.	Land immediately.	Clear the runway.

3. What ground sign do the survivors construct to indicate that they require medical assistance?

   a. X
   b. N
   c. Y
   d. ↑

4. What ground sign do the survivors construct to indicate that they require assistance?

   a. X
   b. N
   c. Y
   d. >

5. What is the meaning of a black ball hoisted on a signals mast or a white  with a white disc placed in the middle of a cross-bar?

   a. Glider flying in progress
   b. Direction of take-off and landing may differ
   c. Movement of aircraft and gliders confined to hard surface areas.
   d. Landing prohibited.

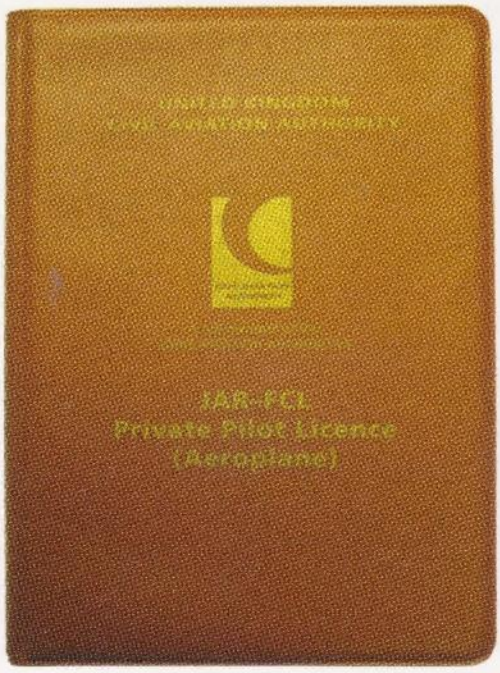
6. What is the meaning of a flashing red light directed from the tower to an aircraft in flight?

   a. Do not land. Aerodrome is unavailable for landing.
   b. Give way to other aircraft and continue circling.
   c. Land immediately
   d. Return to aerodrome.

Question	1	2	3	4	5	6
Answer						

The correct answers to these questions can be found at the end of this book.

ANNEX B
THE JAR - FCL
PRIVATE PILOT'S LICENCE



THE JAR-FCL PRIVATE PILOT'S LICENCE .

INTRODUCTION.

It is a requirement of the JAR-FCL Private Pilot's Licence (JAR-FCL PPL) theoretical knowledge syllabus for Air Law that students should learn about the regulations and conditions attached to the training for, and issue of, a JAR-FCL PPL, and that they should understand the privileges and limitations of the Licence.

Full details of flying training, theoretical knowledge training, the corresponding tests and examinations, and the privileges and limitations pertaining to the JAR-FCL PPL (Aeroplanes) are contained in the Joint Aviation Authorities (JAA) publication, **'JAR–FCL 1 (A)' SUBPART C – PRIVATE PILOT LICENCE (Aeroplanes) – PPL(A).**

Though this chapter deals principally with the JAR-FCL PPL (Aeroplanes), general information contained in this chapter will normally apply also to the JAR-FCL PPL (Helicopters). Full details of the JAR-FCL (Helicopters) is contained in the JAA publication **JAR-FCL A**, **Subpart C**.

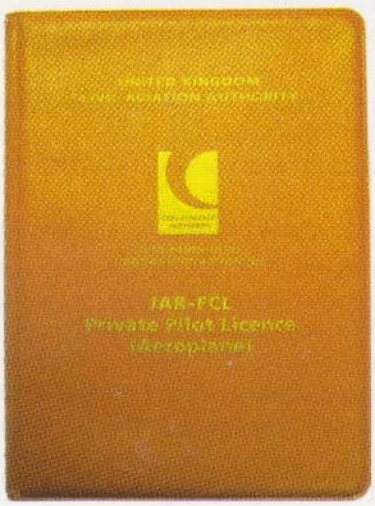


Fig B1 JAR-FCL PPL Licence.

You will sometimes find that the JAR-FCL PPL is referred to as the JAA PPL. Both terms refer to the same licence.

JAR-FCL stands for **Joint Aviation Requirements – Flight Crew Licensing**. In terms of flight crew licensing, the terms **JAA** and **JAR-FCL** are mostly interchangeable. As mentioned in the Foreword to this series of books, the titles of licences are likely to change again when the **European Aviation Safety Agency** takes over general responsibilities for licence issue. Do not allow the nomenclature to concern you over much.

(For students based in the United Kingdom, full details of JAR-FCL PPL training and examinations can be found in the CAA publication ***Licensing Administration Standards Operating Requirements Safety (LASORS)****.)*

THE JAA PPL GENERAL.

In order to qualify for a JAA PPL a candidate must:

- Meet the flying experience requirements and flying theoretical knowledge training requirements.
- Obtain a pass in the skill test conducted on the same class/type of aircraft as that in which he has received flying instruction.

- Hold either a valid Class 1 or valid Class 2 Medical Certificate

If the holder wishes to fly at night, an additional night qualification is required.

AGE.

There is no minimum age prescribed for the commencement of dual instruction for a JAR-FCL PPL(A), but dual instruction received before the age of 14 years does not count towards the flying experience requirements for the issue of a licence.

A candidate for a JAR-FCL PPL may not fly solo before the age of 16. A candidate may not apply for the licence to be issued until he or she has attained the age of 17 years.

PRIVILEGES AND CONDITIONS.

The privileges pertaining to a JAR-FCL PPL issued by the United Kingdom Civil Aviation Authority (UK CAA) are detailed in **Schedule 8** of the **Air Navigation Order**, and summarised in **LASORS**.

Revenue & Non-Revenue Flights

A JAR-FCL PPL (A) holder must not fly as a pilot on revenue-earning flights.

Once the licence has been issued, the holder of a JAR-FCL PPL may fly as the pilot-in-command, or the co-pilot, of any aeroplane for which he holds a type/class rating, on non-revenue flights.

Effectively this means that a PPL holder cannot earn money by exercising the privileges of his licence. The laws surrounding 'revenue flights' or flights for 'valuable consideration' are complex. Therefore, PPL-holders are advised to be very cautious about accepting money or rewards for flights that they conduct. The authorities treat illegal commercial operations extremely seriously. Cost sharing between a PPL holder and his passengers is permitted in accordance with certain conditions. The Air Navigation Order contains details of these conditions.

In order to carry passengers, a PPL-holder must have carried out 3 take- offs and landings as the pilot operating the controls of an aeroplane of the same class/type (or in a flight simulator of the same type/class) in the preceding 90 days.

Carriage of Passengers.

The holder of a JAA PPL(A) is permitted to carry passengers. However, JAR-FCL1.026 requires that a pilot should not operate the controls of an aeroplane with passengers on board unless he has carried out at least **three take-offs and landings** as the pilot operating the controls of an aeroplane of the same type/class (or in a flight simulator of the same type/class) **in the preceding 90 days.** If the pilot holds a Night Qualification, 1 of the 3 take-offs and landings must be at night, if passengers are to be carried at night.

TRAINING FOR THE JAR-FCL PPL (A).

Appendix 1 to JAR-FCL 1.125 lays down the syllabus of training that must be completed before a JAR-FCL PPL(A) licence may be issued.

Fig B2 A Flying Training Organisation (FTO) - Oxford Aviation Training, Oxford Airport.

An applicant for a JAR-FCL PPL (A) must undergo the prescribed syllabus of training at an approved Flying Training Organisation (FTO) or at a registered training facility acceptable to the national authority.

Training for the JAR-FCL PPL (A) consists of **flying instruction** and **theoretical knowledge instruction**.

On completion of training, a candidate's flying proficiency is tested in a **skills test** conducted by an examiner authorised by the national authority. Candidates are also required to pass **theoretical knowledge examinations** in the subjects stipulated by the syllabus *(see below)*.

Flying Training.

An applicant for a JAR-FCL PPL (A) must have completed a minimum of **45 hours total flight time** as a pilot of aeroplanes.

The **45 hours** total experience must be made up of:

a. **Not less than 25 hours dual instruction.**

b. **At least 10 hours supervised solo flight time which must include at least 5 hours of solo cross-country flight time, of which 1 flight must be of at least 270 km (150 nm) during which full-stop landings are made at two aerodromes different from the aerodrome of departure.**

A candidate for a JAR-FCL PPL (A) must have received at least 25 hours dual instruction.

A candidate for a JAR-FCL PPL (A) must have completed at least one solo cross-country flight of at least 270 km (150 nm) during which 2 full stop landings are made at two aerodromes other than the aerodrome of departure.

Of the **45 hours total flying time**, **5 hours** may be completed on a flight navigation procedures trainer (FNPT) or flight simulator. Holders of a pilot's licence or equivalent privileges for aircraft other than an aeroplanes (but excluding balloon and airship licences) may be credited with 10% of the flight time logged on those aircraft (subject to a maximum credit of 10 hours) towards the flying experience required for the issues of a JAR-FCL PPL (A).

If an applicant for a JAR-FCL PPL (A) has been credited with Pilot-in Command flight time on an aircraft other than aeroplanes, the dual instruction requirement is reduced to a minimum of 20 hours.

Night Qualification.

If a night qualification is to be added to the JAR-FCL PPL (A), 5 hours flying must be completed at night, consisting of 3 hours dual instruction, including 1 hour night cross-country navigation and 5 solo night take-offs and full-stop landings.

(Training for a Night Qualification (Aeroplanes) may be included within the 45 hours required for the issue of a JAR-FCL PPL (A), provided the minimum dual and supervised solo requirements are satisfied.)

Recording Flying Experience.

All pilots must keep a record of their flying experience in a pilot's log book. The hours recorded in the pilot's log book must be only those defined as **flight time**.

The flying time to be entered in a pilot's logbook is the time from the aircraft first moving for the purpose of taking off to the time it finally comes to rest at the end of the flight.

Flight time is recorded as the total time from the moment an aircraft first moves for the purpose of taking off until it finally comes to rest at the end of the flight.

A pilot is required to log the flying activity he is carrying out, as well as the flight time. For example, if a student pilot flies 1 hour dual on a cross-country flight he would log:

- 1 hour total.

and, under the appropriate sub-headings in his logbook:

- 1 hour dual
- 1 hour cross-country

Relevant flight simulator time is also recorded in the pilot's log book.

A student pilot is required to carry his log book with him on all solo cross-country flights as evidence of having received the necessary instructor authorisation.

The pilot's log book is a pilot's own personal record of his flying experience. Complete your log book neatly and legibly; you will be glad you did so in later years. If you are required to submit your log book to a national aviation authority, take a photocopy of the latest entries.

Flying Skill Test.

Following completion of the specified PPL(A) flying training, a student pilot has **a period of 6 months in which to take and pass the necessary flying skill test.** This will require the student to demonstrate his ability as pilot-in-command of an aeroplane, to the satisfaction of a Flight Examiner (FE). Full details of the JAR-FCL PPL (A) **Skills Test** are given in **Appendix 1 and 2 to JAR-FCL 1 1.135**.

The **skill test** may be flown on a single or (subject to the experience requirements in JAR-FCL 1.255 or 1.260 of 70 hours flight time as Pilot-in-Command) on a multi-engined aircraft.

An applicant for a JAR-FCL PPL (A) may not take the **skills test** until all of the theoretical knowledge examinations have been passed.

Theoretical Knowledge Examinations.

The training requirements for issue of a JAR-FCL PPL (A) are not confined to flying training. In order to qualify as a private pilot, a student must also demonstrate that he has acquired the **theoretical knowledge** required of a qualified pilot by passing ground examinations in the following subjects:

- Air Law.
- Operational Procedures.
- Aircraft General Knowledge.
- Principles of Flight.
- Meteorology.
- Navigation and Radio Aids.
- Human Performance and Limitations.
- Flight Performance and Planning (including Mass and Balance).
- Radiotelephony Communications.

The examinations consist of multiple-choice questions, and are normally conducted by the Flying Training Organisation or registered training facility at which the student has undergone training. Examination papers may cover several subjects. In the **United Kingdom**, the examination papers currently bear the following titles:

- Air Law and Operational Procedures.
- Human Performance and Limitations.
- Navigation and Radio Aids.
- Meteorology.
- Aircraft (General) and Principles of Flight.
- Flight Performance and Planning (including Mass and Balance).

The pass mark in all papers is 75%.

An applicant for a JAR-FCL PPL (A) is deemed to have successfully completed the theoretical knowledge examinations when he has achieved a pass mark in all subjects within a period of **18 months** of taking the first examination. For the purposes of licence issue, a candidate will be credited with successful completion of the theoretical knowledge examinations for a period of **24 months** after having obtained a pass in all subjects.

RADIOTELEPHONY (RTF) LICENCE.

Student pilots are permitted to use an aircraft's radio without an FRTOL while undergoing flights for the purpose of gaining a pilot's licence.

A JAR-FCL PPL may be issued without the holder needing to possess a **Flight Radiotelephony Operator's Licence (FRTOL)**. But if the PPL holder wishes to operate his aircraft's radio, he must have obtained a **FRTOL**. In order to obtain an **FRTOL**, pilots must pass the practical radiotelephony test and apply for the **FRTOL** separately from the JAR-FCL PPL. You should note that the Radiotelephony paper in the PPL theoretical knowledge examinations does not contribute towards obtaining an **FRTOL**. The **FRTOL** remains a national licence. So the PPL and the **FRTOL** are distinct licences issued under different legislation.

Student pilots are permitted to operate the aircraft's radio, without having obtained a **FRTOL**, during flights for the purpose of gaining a pilot's licence, provided the flight is authorised by a qualified flying instructor.

STATE OF LICENCE ISSUE.

General.

Applicants for a JAR-FCL PPL must complete the requirements for licence issue to the satisfaction of the national aviation authority of the state under whose authority the training and testing for the licence were carried out. That State, on issuing the licence, then becomes the **State of Licence Issue.**

The **State of Licence Issue** is the country in which the aviation authority which authorises you to act as a pilot is headquartered.

Despite the multinational nature of the JAA, each nation's aviation authority (NAA) acts under the authority of the legislature of that nation. Hence, the Civil Aviation Authority is the licence-issuing authority for the United Kingdom.

Training in Different JAA Countries.

It is permitted for a student pilot to commence his training in one State and complete it in another State. In this case, the NAAs of the states concerned will agree which state is to act as the **State of Licence Issue**.

If the holder of a licence requires additional ratings or authorisations, in accordance with JAR-FCL, these may be obtained in any JAA State and subsequently be entered in the licence by the **State of Licence Issue**.

A JAR-FCL PPL (A) licence holder may apply to transfer his licence from one state to another if he is normally resident in the new State (at least 185 days per year) or if he has taken up employment there.

TRANSFER OF STATE OF LICENCE ISSUE.

It is permitted for a licence holder to make a request for his licence to be transferred from one JAA State to another if there is an administrative need to do so. For instance, if the holder changes his **State of normal residency** (the place where he normally lives for at least 185 days in any year) or if he takes up employment in the new state, the new state may become the **State of Licence Issue**.

A JAR-FCL PPL (A) is valid for 5 years.

Validity of Licences and Ratings.

A JAR-FCL PPL (A) is valid for a period of 5 years.

Providing that a pilot has renewed his medical certificate (see below) and has not

had the licence revoked or suspended by the NAA, a PPL will be reissued, at the end of the 5 years validity period, on submission of the necessary paperwork and fees to the NAA.

TYPE AND CLASS RATINGS.

General Requirements.

In addition to his pilot's licence, a pilot will also be required to hold a valid **Class Rating** for any aeroplane that he wishes to fly.

Aeroplanes are divided into classes and types.

Aeroplanes are divided into **Classes** and, further, into **Types**. Generally, **Class Ratings** are for simple aircraft and a **Type Rating** is required for a more sophisticated aircraft.

THE SKILL TEST AND CLASS RATING.

If the **Skill Test** for the JAR-FCL PPL (A) is taken in a simple, light aircraft, the **PPL Skill Test** also counts as the **Class Rating Test** for the class of aeroplane in question, most commonly the **Single-Engine Piston (Land) Class**.

In addition to a pilot's licence, a pilot must also hold a valid class or type rating, and a current medical certificate.

If a pilot wishes to fly other classes or types of aeroplanes he will be required to pass a separate **skill test** on each class or type of aeroplane he intends to fly.

Class Rating.

A **Class Rating** qualifies a pilot to fly as Pilot-in-Command of any aeroplane within that **Class**.

Class Ratings are issued for the following classes of aeroplanes:

- All single-engine piston aeroplanes (land).
- All single-engine piston aeroplanes (sea).
- All touring motor gliders.
- Each manufacturer of single-engine turbo-prop aeroplanes (land).
- Each manufacturer of single-engine turbo-prop aeroplanes (sea).
- All multi-engine piston aeroplanes (land).
- All multi-engine piston aeroplanes (sea).

There is no limitation on the number of class or type Ratings that a pilot may hold at any one time.

Differences Training.

Although a class rating, in general, qualifies a pilot to fly any aeroplane within that class, **differences training** may be required in order that he may pilot a variant of aircraft within the class which has markedly different flying characteristics and technical and performance specifications.

For the Single-Engine Piston (Land) pilot, a category which encompasses the majority of PPL holders, **differences training** is required when changing from the simple, light, fixed tricycle-undercarriage, fixed-pitch propeller aeroplane to aeroplanes displaying the following features:

- Variable-pitch propellers.
- Retractable undercarriage.
- Turbo/super-charged engine.
- Cabin pressurisation.
- Tail wheel.

Whether or not **differences training** is a formal requirement, pilots should always arrange to undergo instruction with an appropriately qualified flying instructor when considering flying an aeroplane which has significantly different flying characteristics to the aircraft they are used to.

The Type Rating.

In general, **type ratings** are required for:

- Each type of multi-pilot aeroplane.
- Each type of single-pilot, multi-engine aeroplane fitted with turbo-prop or turbojet engines.
- Each type of single-pilot, single-engine aeroplane fitted with turbojet engines
- Any other type of aeroplane considered necessary by the National Aviation Authority.

To obtain a **type rating**, a pilot will need to:

- Attend a type rating course for the relevant type, consisting of both theoretical knowledge and flying instruction.
- Pass a theoretical knowledge examination.
- Pass a **skill test** on the aircraft type, conducted by a Type Rating Examiner (TRE).

VALIDITY OF CLASS AND TYPE RATINGS.

The validity of a pilot's licence is dependent on the validity of the ratings it contains and the currency of the associated medical certificate.

A single-pilot, single-engine piston Class Rating is valid for 2 years.

Single-Pilot, Single-Engine Class Ratings.

Single-pilot, single-engine Class Ratings (including Touring Motor Glider ratings) are valid for **2 years**. In order to be re-validated for this type of rating, the pilot must either:

- Pass a proficiency check with an authorised examiner within the 3 months preceding the expiry date of the Rating,

or

- Within 12 months of the expiry date of the rating, have flown 12 hours on an aircraft of the relevant class, to include:
  - 6 hours as Pilot-in-Command.
  - 12 take-offs and 12 landings.
  - A training flight of at least 1 hour's duration with a Flight Instructor or a Class Rating Instructor.

To renew a single-pilot, single-engine piston Class Rating, a pilot must have passed a proficiency check within 3 months of the expiry of the rating, or have renewed the rating by virtue of flying experience.

To renew a single-pilot, single-engine piston Class Rating by experience, a pilot must, within 12 months of the rating expiring, have completed 12 hours flying, of which 6 hours is as pilot-in-command, have completed 12 take-offs and landings, and a flight of at least one hour's duration with a qualified instructor.

Type Ratings and Multi-Engine Class Ratings.

Type Ratings and Multi-Engine Class Ratings are valid for a period of 1 year from the date of issue. To revalidate a **Type Rating**, or a **Multi-Engine Class Rating**, a pilot must pass a proficiency test with an authorised examiner within the **3 months** immediately preceding the date of expiry of the Rating. If the qualification is revalidated within the period of validity, the new Rating will be valid from the date of expiry of the old rating.

Failure of a Proficiency Check.

If a pilot fails any part of a **proficiency check** for a class rating or type rating, he must not exercise the privileges of that rating until all the parts of the **proficiency check** have been successfully completed.

Consequently, if during the last 3 months of a PPL (A) Single-Engine Piston Class Rating, a pilot takes and fails a revalidation **proficiency check**, his current class rating becomes invalid until the **proficiency check** has been successfully completed.

EXPIRY OF A CLASS OR TYPE RATING.

If a pilot allows his class or type rating to **expire** the rating will have to be renewed, if the pilot again wishes to exercise the privileges of the rating. Renewal may entail refresher training, and will entail having to re-take the appropriate skill test.

For an **expired** single-pilot single-engine class rating to be renewed, a pilot must successfully complete the initial skill test in accordance with **Appendix 3** to **Paragraph 1.240** of **Section** 1 of **JAR-FCL 1 (A)**.

ADDITIONAL RATINGS.

As the holder of a JAR-FCL PPL (A), a pilot is entitled to fly as pilot-in-command or co-pilot of an aeroplane of any of the types and classes specified in his licence. Normally, the licence holder may exercise the privileges of his licence in any JAA member state, while flying an aircraft registered in a JAA member state.

A basic JAR-FCL PPL (A) holder may not normally, however:

- fly for renumeration.
- give flying instruction.
- conduct flying tests.
- fly as pilot-in-command in uncontrolled airspace when the flight visibility is less than 3 km (except, in certain circumstances, in the United Kingdom).
- fly as pilot-in-command within a Control Zone on a Special VFR Clearance, when the flight visibility is less than 10 km.
- fly out of sight of the surface.
- fly as pilot-in-command in controlled airspace in circumstances which require compliance with the Instrument Flight Rules.
- fly at night.

Various ratings can be added to the basic JAR-FCL PPL (A) which bestow extended privileges on the licence holder. Each rating has its own regulation pertaining to revalidation and renewal. Here is a summary of additional ratings that a PPL (A) holder may add to his licence: Full details may be found in **LASORS**.

- **IMC Rating (Aeroplanes)**. The IMC Rating is a United Kingdom national rating which may be added to a UK-issued pilot's licence only. The IMC Rating entitles the holder to fly as pilot-in-command in weather minima below those with which the basic PPL holder must comply. The holder of an IMC Rating may also fly in accordance with IFR in Class D and E airspace, with the necessary ATC clearances. (See **OATmedia's** interactive CD-ROM **'The IMC Rating and Instrument Flying.'**) The privileges of the **IMC Rating** may not be exercised in any other country than the United Kingdom, unless permission to do so has been given by the appropriate authority of that country.
- **Instrument Rating (Aeroplanes)**. The holder of a full Instrument Rating may fly as pilot-in-command without being subject to VFR or IMC Rating weather minima, and fly IFR in controlled airspace.
- **Night Qualification (Aeroplanes)**. The Night Qualification (Aeroplanes) allows the holder to fly as pilot-in-command of an aeroplane, at night.
- **Flying Instructor Rating**. A Flying Instructor's Rating entitles the holder to give instruction in flying. Usually a candidate for a Flying Instructor Rating initially seeks to qualify through the award of an Assistant Flying Instructor Rating.

THE UNITED KINGDOM NATIONAL PRIVATE PILOT'S LICENCE.

In the United Kingdom, in order to make it easier for the recreational flyer to obtain a PPL than it would be if the requirements of the standard JAR-FCL PPL had to be met, the **United Kingdom National Private Pilot's Licence (UK NPPL)** has been introduced.

Full details of the regulations governing the training for, issue of and privileges of the **UK NPPL** may be found by consulting **LASORS** and the **Air Navigation Order**. Most flying club websites give details of the **NPPL**. The **NPPL** also has its own medical requirements.

The **NPPL** is a "sub-ICAO" licence and the holder of a **UK NPPL (A)** is restricted to flight in a simple, UK-registered, single-engine piston aeroplane (including motor gliders and microlights) whose Maximum Authorized Take-off Weight does not exceed 2000 kg. Flight is normally permitted in UK airspace only, by day, and in accordance with the Visual Flight Rules.

Flying Training.

Currently 32 hours of flying training are required for the issue of a **UK NPPL (A)**, of which 22 hours are to be dual instruction, and 10 hours to be supervised solo flying time.

There are separate general and navigation skills tests.

Theoretical Knowledge Examinations.

The UK NPPL theoretical knowledge syllabus and ground examinations are the same as for the JAA PPL (A).

MEDICAL REQUIREMENTS.

- An applicant for a JAR-FCL PPL must hold a valid JAA Class 1 or Class 2 Medical Certificate issued within the provisions of **JAR-FCL 3**.

- A student pilot must hold a valid Medical Certificate, before he will be permitted to fly solo.

A Class 1 or Class 2 medical certificate must be held by a candidate for a JAR-FCL PPL (A) licence.

General Requirements.

Private Pilots must be mentally and physically fit to exercise the privileges of their licence. This is a continuing requirement and places the onus on the pilot to maintain fitness to fly. If a pilot does not feel fit to fly, he should seek professional advice preferably from an aeromedical practitioner, to determine his medical fitness.

If you allow your medical certificate to expire, your pilot's licence expires immediately.

N.B. If a pilot allows his medical certificate to expire, his licence becomes invalid immediately. Consequently, it is most important to arrange medical examinations early to insure that this does not happen.

The regulations governing medical fitness are different for the **UK NPPL (A)** and the **JAR-FCL PPL (A)**.

MEDICAL EXAMINATIONS.

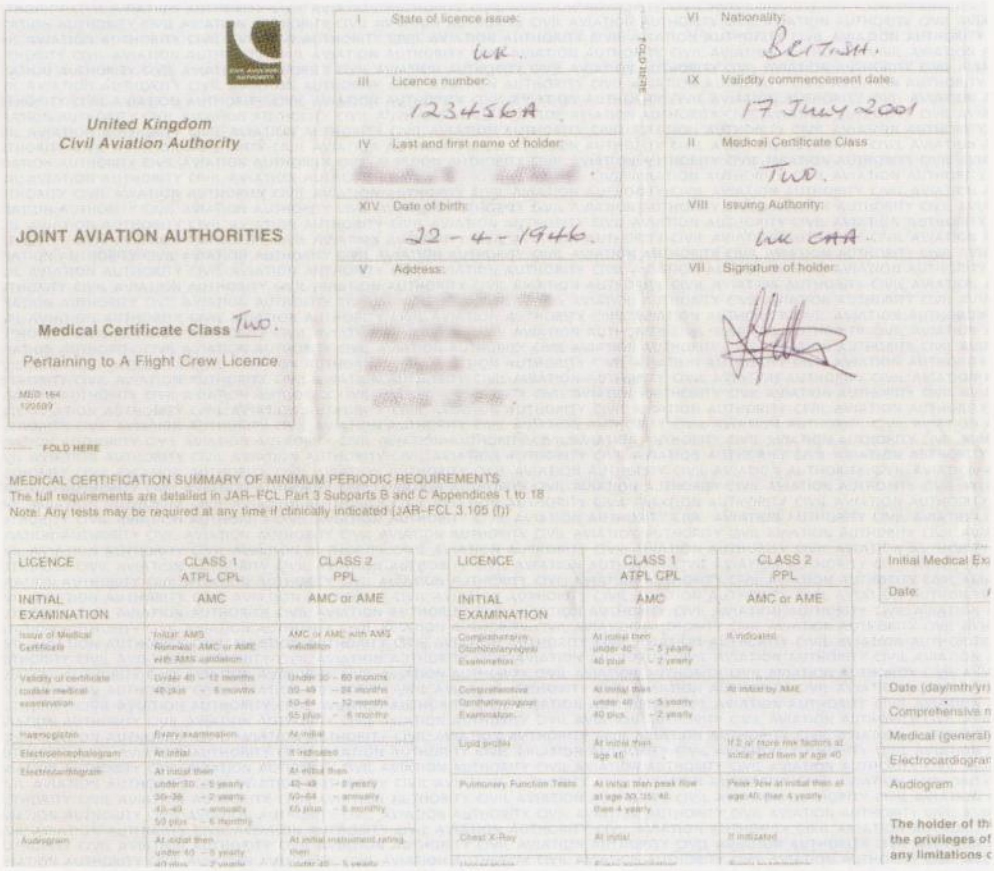
Class Two Initial and Revalidation Examinations.

A Class 2 medical examination must be conducted either:

- At an Aeromedical Centre (AMC). In the UK this is at the CAA Aeromedical Centre at Gatwick,

or

- By an Authorised Medical Examiner (AME). A list of AMEs can be found on the CAA Website.



United Kingdom
Civil Aviation Authority

JOINT AVIATION AUTHORITIES

Medical Certificate Class Two.

Pertaining to A Flight Crew Licence

I State of licence issue: UK.

III Licence number: 123456A

IV Last and first name of holder:

XIV Date of birth: 22-4-1946.

V Address:

VI Nationality: BRITISH.

IX Validity commencement date: 17 JULY 2001

II Medical Certificate Class: TWO.

VIII Issuing Authority: UK CAA

VII Signature of holder:

FOLD HERE

MEDICAL CERTIFICATION SUMMARY OF MINIMUM PERIODIC REQUIREMENTS
The full requirements are detailed in JAR-FCL Part 3 Subparts B and C Appendices 1 to 18
Note: Any tests may be required at any time if clinically indicated (JAR-FCL 3.105 (f))

LICENCE	CLASS 1 ATPL CPL	CLASS 2 PPL
INITIAL EXAMINATION	AMC	AMC or AME
Issue of Medical Certificate	Initial: AMC Renewal: AMC or AME with AMS validation	AMC or AME with AMS validation
Validity of certificate (subject medical examination)	Under 40 – 12 months 40 plus – 6 months	Under 30 – 60 months 30–49 – 24 months 50–64 – 12 months 65 plus – 6 months
Haemoglobin	Every examination	At initial
Electroencephalogram	At initial	If indicated
Electrocardiogram	At initial then under 30 – 5 yearly 30–39 – 2 yearly 40–49 – annually 50 plus – 6 monthly	At initial then 40–49 – 2 yearly 50–64 – annually 65 plus – 6 monthly
Audiogram	At initial then under 40 – 5 yearly 40 plus – 2 yearly	At initial instrument rating then under 40 – 5 yearly

LICENCE	CLASS 1 ATPL CPL	CLASS 2 PPL
INITIAL EXAMINATION	AMC	AMC or AME
Comprehensive Ophthalmological Examination	At initial then under 40 – 5 yearly 40 plus – 2 yearly	If indicated
Comprehensive Ophthalmological Examination	At initial then under 40 – 5 yearly 40 plus – 2 yearly	At initial by AME
Lipid profile	At initial then age 40	If 2 or more risk factors at initial and then at age 40
Pulmonary Function Tests	At initial then peak flow at age 30, 35, 40 then 4 yearly	Peak flow at initial then at age 40, then 4 yearly
Chest X-Ray	At initial	If indicated

Initial Medical Ex
Date:

Date (day/mth/yr)
Comprehensive
Medical (general)
Electrocardiogra
Audiogram

The holder of th
the privileges of
any limitations

Fig B3 A Class 2 Medical Certificate.

Validity of a Class 2 medical certificate for the JAR-FCL PPL (A):

Up to 30 years of age:
60 months

30 years and up to 50 years:
24 months

50 years and over:
12 months

For the issue of a JAR-FCL PPL in the United Kingdom, the initial JAR-FCL Class 2 medical examination may be obtained from a UK CAA AME or from an AME in a mutually recognised JAA member state.

MEDICAL CERTIFICATE.

General.

A pilot's Medical Certificate is regarded as an integral part of his licence.
The issue of the certificate will follow a successful initial medical examination conducted by an Authorised Medical Examiner. Once the medical certificate has

been issued, its continuing validity will depend upon the pilot passing a periodical medical examination.

Validity of a Class 2 Medical Certificate.

The intervals between required medical examinations depend on the age of the pilot. The intervals are as follows:

Up to the age of 30 years: every 60 months.

30 years and up to 50 years: every 24 months.

50 years and over: every 12 months.

Note: A **medical certificate** issued before a pilot's 30th birthday will not be valid after his 32nd birthday. (In other words as soon as a pilot attains the age of 30, his Medical Certificate can only be valid for a maximum of 2 further years.)

If the revalidation of a medical certificate takes place within 45 days prior to the expiry date, the validity of the new medical certificate extends from the expiry date of the previous certificate.

If the holder of a JAR-FCL pilot's licence suffers from a condition which affects his ability to act as a flight crew member, he must inform the National Aviation Authority, in writing, either immediately or, in the case of illness, within a period of 21 days.

Decrease in Medical Fitness.

The holder of a medical certificate who becomes aware of any of the circumstances below must inform the National Aviation Authority of the condition, in writing, immediately, or after a period of 21 days for illness.

- A hospital or clinic admission for more than 12 hours.
- Any surgical operation or invasive procedure.
- The need for regular use of medication.
- The regular need to wear correcting lenses.
- An incapacitating injury.
- Any illness which incapacitates a pilot and prevents him from flying as a pilot throughout a period of 21 days or more.
- Pregnancy.

A pilot's medical certificate (and, therefore, his licence) will be deemed to be suspended during the period of incapacity. The suspension will be lifted after a medical examination passes a pilot fit once more.

In the case of pregnancy, the suspension may be temporarily lifted during the early months of the pregnancy and finally lifted after the end of the pregnancy when the pilot has been declared fit to resume flying.

Representative PPL - type questions to test your theoretical knowledge of JAA Licensing.

1. Of the total hours requirement for the issue of a JAA PPL(A), how many may be flown in a FNPT or Flight Simulator?

   a. 5
   b. 10
   c. 15
   d. 2

2. Which of the following statements applies to the carriage of passengers by the holder of a JAR-FCL PPL(A) licence?

   a. Any money you receive must be given to charity
   b. You cannot carry passengers with a JAA PPL(A)
   c. You must have made 3 take-offs and landings in the last 90 days
   d. You must receive special clearance to carry passengers

3. Which of the following does a pilot require in addition to his licence in order to fly an aeroplane?

   a. A Medical certificate issued in accordance with JAR-FCL 3
   b. A valid type rating only
   c. A radiotelephony licence
   d. An MCC certificate

4. The flying experience that you record in your pilot's log book must be only:

   a. Actual airborne time
   b. Flight time only (as defined as the total time from when the aircraft first moves for the purpose of taking off until it finally comes to rest at the end of the flight)
   c. Flight time, as defined in b, above, but also to include relevant simulator and flight navigation procedure trainer (FNPT) hours
   d. Flight time and taxi time only

5. In addition to your pilot licence, what else is required before you can exercise the privilege of the licence?

   a. A valid medical certificate and a valid Class Rating or Type Rating
   b. A valid medical certificate, a valid Class Rating or Type Rating and a valid Instrument Rating
   c. A valid medical certificate and a valid Class Rating or Type Rating and recent experience consisting of 3 take-offs and landings in the past 90 days
   d. A valid medical certificate and an MCC Certificate for dual operations

6. What does a student pilot require in order to fly a solo training sortie?

a. A Class or Type Rating
b. A certificate of proficiency signed by his instructor
c. To have attained 17 years of age
d. A valid medical certificate, be at least 16 years of age, and have the authorisation of a qualified flying instructor.

7. The JAA document dealing with matters relating to the training for and issue of pilots' licences for flying aeroplanes is:

a. JAR OPS-3
b. JAR FCL-3
c. JAR FCL-2
d. JAR FCL-1

8. For how long is the Class Rating for a single-pilot, single-engine aircraft valid?

a. 1 year
b. 2 years
c. 3 years
d. 5 years

9. A pilot gained his JAR-FCL PPL (A) on a single piston-engine, fixed tricycle-undercarriage aircraft, fitted with a constant speed propeller. For which of the following types of aircraft would he be required to undergo differences training?

a. Any aircraft of similar handling characteristics
b. A similar aircraft fitted with a Global Positioning Navigation System
c. A tail wheel aeroplane
d. A similar aircraft fitted with electrically operated flaps

10. You are the holder of a JAR-FCL PPL(A). If your optician tells you that you now need to use spectacles to read, do you need to tell the Licensing Authority?

a. No
b. Yes, immediately
c. Yes, but only if you cannot read the instruments without the spectacles
d. Not if contact lenses solve your problem

11. As part of the flying experience a student pilot needs for the issue of a JAR-FCL PPL (A), he must undertake a solo cross-country flight. At least one cross-country flight must exceed a stated minimum distance. What is this distance?

a. 100 nm
b. 150 nm
c. 200 nm
d. 270 nm

12. For which of the following aircraft types would a pilot require a Type Rating?

    a. An aeroplane with dual controls
    b. A single-pilot aeroplane with a variable-pitch propeller
    c. A single-pilot aeroplane fitted with a turbo-prop or gas-turbine engine
    d. A touring motor glider

13. Can the Class Rating for a single-engine piston aeroplane (land) be revalidated by a proficiency check?

    a. Yes, but the check must be completed within the 3 months prior to the expiry date of the current rating
    b. No, the rating is experience dependent, only
    c. Yes, but there is also an experience requirement which must also be achieved
    d. No

14. Can a student pilot 'log' all dual instructional time towards the 45 hours experience he needs to gain his licence?

    a. No, he can only log half the dual time
    b. No, he cannot log any instruction hours, it must all be solo hours
    c. Yes, provided he has attained the age of 14
    d. Only if it is VMC time

15. For how long is a Class 2 Medical Certificate for a JAR-FCL PPL (A) valid for a pilot who is 34 years of age?

    a. 60 months
    b. 24 months
    c. 12 months
    d. 6 months

16. One of the requirements permitting the retention of a current single-engine piston class rating for a JAR-FCL PPL (A) holder is that, preceding the expiry of the rating, a pilot must fly:

    a. 20 hours flight time in the relevant Class of aeroplane within the preceding 2 years
    b. 4 hours as Pilot-in-Command within the preceding 12 months
    c. 10 take-offs and 10 landings within the preceding 12 months
    d. A training flight of at least 1 hour's duration with a qualified Flying Instructor or a Class Rating Instructor within the preceding 3 months

17. In order to exercise the privileges of a flying licence, the holder must hold a Medical Certificate issued in accordance with the provisions of:

a. JAR-FCL 1
b. JAR-FCL 2
c. JAR-FCL 3
d. JAR-FCL 4

18. The definitive privileges of licences and ratings issued by the United Kingdom Civil Aviation Authority (UK CAA) are contained in:

a. The appropriate UK CAA Safety Sense Leaflet
b. Schedule 8 of the Air Navigation Order.
c. The United Kingdom Aeronautical Information Publication
d. In the appropriate AIC.

19. If the holder of a JAR-FCL PPL (A) has discovered that he has a medical condition for which he needs surgery, he should:

a. Consult an authorised medical authority as soon as possible
b. Continue to fly as normal but, not fly as pilot-in-command during the 24 hours preceding the surgery
c. Continue to fly as normal until admitted to hospital
d. Not fly until 6 months after the surgery has been performed

20. In order to be able to carry passengers, the holder of a JAR-FCL PPL (A) must have met the following currency requirements:

a. 3 take-offs and 3 landings within the preceding 28 days
b. 3 take-offs and 3 landings within the preceding 90 days
c. 5 take-offs and 5 landings within the preceding 28 days
d. 5 take-offs and 5 landings within the preceding 90 days

21. The flying hours that the holder of a JAR-FCL licence enters in his pilot's log book are defined as:

a. The time from lift-off to touch down
b. Airborne time only
c. The time from engine start to engine shutdown
d. The time from the aircraft's first moving under its own power to its coming to rest at the end of the flight

22. What are the options open to the holder of a JAR-PCL PPL (A) for revalidating a single-pilot, single-engine piston Class Rating?

a. Complete a proficiency check within 3 months preceding the expiry of the Class Rating, and also, within 12 months of its expiry, have completed 12 hours flying time, including 6 hours as pilot-in-command, with 12 take-offs and landings, and to include a flight of at least one hour's duration with a qualified flying instructor or class rating instructor.
b. Complete a proficiency check within 12 months preceeding the expiry of the Class Rating, or, within 24 months of its expiry, have completed 12 hours flying time, including 6 hours as pilot in command, with 12 take-offs and landings, and to include a flight of at least one hour's duration with a qualified flying instructor or class rating instructor.
c. Complete a proficiency check within 3 months preceeding the expiry of the Class Rating, or, within 12 months of its expiry, have completed 12 hours flying time, including 6 hours as pilot-in-command, with 12 take-offs and landings, and to include a flight of at least one hour's duration with a qualified flying instructor or class rating instructor.
d. Complete a proficiency check within 3 months preceeding the expiry of the Class Rating, and also, within 24 months of its expiry, have completed 12 hours flying time, including 5 hours as pilot-in-command, with 10 take-offs and landings, and to include a flight of at least one hour's duration with a qualified flying instructor.

23. The holder of a medical certificate issued in accordance with JAR-FCL 3 must inform the appropriate National Aviation Authority, in writing, of any condition which affects his ability to act as a flight crew member if:

a. In the case of sickness, the condition makes him unfit to act as a flight crew member for 21 days or more
b. The condition will make him unfit to act as a flight crew member beyond the date of expiry of his medical certificate
c. He is advised to do so by his flying instructor
d. A visit to a doctor has been necessary

24. The holder of a JAR-FCL pilot's licence is entitled to act as pilot-in-command of an aircraft only if:

a. He holds at least a valid class rating for the aircraft he is to fly
b. He holds at least a valid medical rating
c. He also holds an Instrument Rating or Night Qualification for the aircraft he is to fly
d. He also holds a valid medical certificate for his licence and a valid class or type rating for the aircraft he is to fly

25. The period of validity of a JAR-FCL PPL (A) is

a. 3 years
b. Life
c. 5 years
d. 10 years

26. For the purposes of obtaining a JAR-FCL PPL (A), flying hours accumulated towards the issue of the licence must have been carried out in an aircraft:

a. Of the same type as that for which the basic licence is to be issued
b. Of the same class as that for which the basic licence is to be issued
c. Of the same performance category as that for which the basic licence is to be issued
d. With the same type of propeller as that for which the basic licence is to be issued

27. An injury which incapacitates the holder of a JAR-FCL pilot's licence:

a. Renders the associated medical certificate invalid as soon as the National Aviation Authority is informed in writing of the injury
b. Automatically renders invalid the associated medical certificate
c. Does not affect the validity of the medical certificate but the licence-holder must not fly as pilot while he remains incapacitated
d. Will prevent a valid medical certificate from being revalidated

28. A pilot who does not hold a Flight Radiotelephony Operator's Licence (FRTOL) may operate an aircraft's radio:

a. Provided he does not seek a full air traffic control service
b. Provided he remains clear of controlled airspace
c. If flying as a student pilot with the authorisation of a qualified flying instructor for the purposes of obtaining a pilot's licence
d. Provided he is accompanied by a qualified pilot who is an FRTOL holder .

29. The minimum number of dual instructional hours to be completed by a candidate for a JAR-FCL PPL (A) is:

a. 25 hours
b. 45 hours
c. 10 hours
d. 30 hours

30. A JAR-FCL PPL (A) holder may:

a. Not fly in controlled airspace
b. Not operate as a pilot on a revenue-earning flight or flight for "valuable consideration"
c. Not operate above the transition level
d. Not fly in accordance with the Instrument Flight Rules

31. In order to transfer a JAR-FCL pilot's licence from the State of Licence Issue to another JAA member state the licence holder must:

a. Be normally resident in the new State (for at least 185 days per year) or have taken up full-time employment within that State
b. Have resided in the new State for at least 30 consecutive days.
c. Reside in the new State for a minimum of 30 days annually.
d. Must have become a citizen of the new State

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer												

Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer												

Question	25	26	27	28	29	30	31
Answer							

The answers to these questions can be found at the end of this book.

ANNEX C
AIR LAW DEFINITIONS

DEFINITIONS.

Accident: An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which :

a. A person is fatally or seriously injured as a result of :

- being in the aircraft,

or

- direct contact with any part of the aircraft, including parts which have become detached from the aircraft,

or

- direct exposure to jet blast,

except when the injuries are:

- from natural causes, or
- self-inflicted, or
- inflicted by other persons, or
- to stowaways hiding outside the areas normally available to passenger or crew,

or

b. the aircraft sustains damage or structural failure which:

- adversely affects the structural strength, performance or characteristics of the aircraft and
- would normally require major repair or replacement of the affected part except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin .

or

c. the aircraft is missing or is completely inaccessible

Advisory Airspace: An airspace of defined dimensions, or designated route, within which an air traffic advisory service is available.

Advisory Route (ADR): A designated route along which an air traffic advisory service is available.

Aerial Work: Any purpose (other than public transport) for which an aircraft is flown if valuable consideration is given or promised in respect of the flight or the purpose of the flight. Examples of this would be agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.

Aerobatic Flight: Manoeuvres intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed and includes loops, spins, rolls, bunts, stall turns, inverted flying and any other similar manoeuvre.

Aerodrome: A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome Beacon: An Aerodrome Beacon is used to indicate the location of an aerodrome from the air.

Aerodrome Control Service: An air traffic control service for aerodrome traffic.

Aerodrome Control Tower: A unit established to provide an air traffic control service to aerodrome traffic.

Aerodrome Elevation: The elevation of the highest point of the landing area.

Aerodrome Operating Minima: The limits of usability of an aerodrome for:

- Take-off, expressed in terms of runway visual range (RVR) and/or visibility and, if necessary, cloud conditions.
- Landing in precision approach and landing operations with vertical guidance expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/DH).
- Landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/ height (MDA/H) and if necessary cloud conditions.

Note : The basic difference between a precision and a non-precision approach is that in a precision approach the pilot will receive vertical as well as horizontal guidance.

Aerodrome Reference Point (ARP): The designated geographical location of an aerodrome.

Aerodrome Traffic: All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

Note: An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.

Aerodrome Traffic Circuit: The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

Aerodrome Traffic Zone: An airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic.

Aeronautical Information Publication (AIP): A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

Aeronautical Station: A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located on board ship or on a platform at sea.

Aeroplane: A power-driven heavier-than-air aircraft, deriving its lift chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Aircraft: Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Aircraft Stand: A designated area on an apron intended to be used for parking an aircraft.

Air-ground Control Radio Station: An aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of aircraft in a given area.

AIRMET Information: Information issued by a meteorological watch office concerning the occurrence or expected occurrence of en-route weather which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for the region.

AIRPROX: The code word used in an air traffic incident report to designate aircraft proximity.

Air Traffic: All aircraft in flight or operating on the manoeuvring area of an aerodrome.

Air Traffic Advisory Service: A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating in accordance with IFR flight plans.

Air Traffic Control Clearance: Authorisation for an aircraft to proceed under conditions specified by an Air Traffic Control Unit.

Note 1:- For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance" when used in appropriate contexts.

Note 2:- The abbreviated term "clearance" may be prefixed by the words "taxi", "take-off", "departure", "en route", "approach" or "landing" to indicate the particular portion of flight to which the air traffic control clearance relates.

Air Traffic Control Service: A service provided for the purpose of :
a) preventing collisions:

1) between aircraft,

and

2) on the manoeuvring area between aircraft and obstructions, and

b) expediting and maintaining an orderly flow of air traffic.

Air Traffic Control Unit: A generic term referring to a unit responsible for the control of air traffic, meaning variously: Area Control Centre, Approach Control Centre or Aerodrome Control Tower.

Air Traffic Flow Management (ATFM): A service established with the objective of contributing to the safe, orderly and expeditious flow of traffic by ensuring that air traffic control service (ATCS) capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATCS authority.

Air Traffic Service: A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

Air Traffic Services Airspace: Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

Note:- Air Traffic Services Airspace is classified as Class A to G, inclusive.

Air Traffic Services Reporting Office: A unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure.

Note:- An Air Traffic Services Reporting Office may be established as a separate unit or combined with an existing unit, such as another Air Traffic Services Unit, or a unit of the Aeronautical Information Service.

Air Traffic Services Unit:- A generic term meaning variously, Air Traffic Control Unit, Flight Information Centre or Air Traffic Services Reporting Office.

Airway: A control area or portion thereof established in the form of a corridor.

Alerting Post: A unit designated to receive information from the general public regarding aeroplanes in an emergency and to forward the information to the associated Rescue Coordination Centre (RCC).

Alerting Service: A service provided to notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

Alert Phase: A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

Alternate Aerodrome: An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing. Alternate aerodromes include the following :

Take-off Alternate: An alternate aerodrome at which an aircraft can land should this become necessary shortly after take-off when it is not possible to use the aerodrome of departure.

En-route Alternate: An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency situation while en-route.

Destination Alternate: An alternate aerodrome to which an aircraft may proceed should it become either impossible or inadvisable to land at the aerodrome of intended landing.

Note:- The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.

Altitude: The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

Approach Control Office: A unit established to provide an Air Traffic Control Service to controlled flights arriving at, or departing from, one or more aerodromes.

Approach Control Service: An Air Traffic Control Service for arriving or departing controlled flights.

Appropriate ATS Authority: The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

Appropriate authority:-

a) Regarding flight over the high seas: The relevant authority of the State of Registry.

b) Regarding flight other than over the high seas: The relevant authority of the State having sovereignty over the territory being overflown.

Apron: A defined area, on a land aerodrome, intended to accommodate aircraft for the purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

Area Control Centre: A unit established to provide an Air Traffic Control Service to controlled flights in control areas under its jurisdiction.

Area Control Service: An Air Traffic Control Service for controlled flights in control areas.

ATS Route: A specified route designed for channeling the flow of traffic as necessary for the provision of air traffic services.

Note 1:- The term "ATS Route" is used to mean variously: airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

Automatic Terminal Information Service (ATIS): The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specific time period.

Blind Transmission: A transmission from one station to another station in circumstances where two-way communication cannot be established but where it is believed that the called station is able to receive the transmission.

Ceiling: The height above the ground or water of the base of the lowest layer of cloud below 6 000 metres (20 000 feet) covering more than half the sky.

Clearance Limit: The point to which an aircraft is granted an air traffic control clearance.

Clearway: A defined rectangular area on the ground or water, under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.

Common Mark: A mark assigned by I.C.A.O. to the common mark registering authority registering an aircraft of an international agency on other than a national basis.

Congested Area: in relation to a city, town or settlement, means any area which is substantially used for residential, industrial, commercial or recreational purposes.

Contracting State: Any State which is party to the Chicago Convention.

Control Area (CTA): A controlled airspace extending upwards from a specified limit above the earth.

Controlled Aerodrome: An aerodrome at which air traffic control service is provided to aerodrome traffic.

Controlled Airspace: An airspace of defined dimensions within which an Air Traffic Control Service is provided in accordance with the airspace classification system.

Note:- Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D and E, inclusive.

Controlled Flight: Any flight which is subject to an Air Traffic Control Clearance.

Control Zone (CTR): A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

Cruising level: A level maintained during a significant portion of a flight.

Danger Area: An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Dangerous Goods: Articles or substances which are capable of posing a risk to health, safety, property, or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to the Instructions.

Decision Altitude (DA) or Decision Height (DH): A specified altitude or height during a precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Declared Distances:

a. Take-Off Run Available (TORA). The length of runway declared available and suitable for the ground run of an aircraft taking-off.

b. Take-Off Distance Available (TODA). The length of the take-off run available plus the length of the clearway, if provided.

c. Accelerate-Stop Distance Available (ASDA). The length of the take-off run available plus the length of the stopway, if provided.

d. Landing Distance Available (LDA). The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

Displaced Threshold: A threshold not located at the extremity of a runway.

Distress Phase: A situation where there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

Ditching: The forced landing of an aeroplane on water.

Elevation: The vertical distance of a point or a level, on the surface of the earth, measured from mean sea level.

Emergency Phase: A generic term meaning, as the case may be, Uncertainty Phase, Alert Phase or Distress Phase.

Estimated Elapsed Time: The estimated time required to proceed from one significant point to another.

Estimated Off-Block Time: The estimated time at which the aircraft will commence movement associated with departure.

Estimated Time of Arrival: For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome.

Expected Approach Time: The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding point to complete its approach for a landing.

Flight Information Centre (FIC): A unit established to provide flight information service and alerting service.

Flight Information Region (FIR): An airspace of defined dimensions within which a Flight Information Service and an Alerting Service are provided.

Flight Information Service (FIS): A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

Flight Level: A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

Flight Plan: Specified information provided to Air Traffic Services Units, relative to an intended flight or portion of a flight of an aircraft.

Flight Time – Aeroplanes: The total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

Flight Time – Helicopters: The total time from the moment a helicopter's blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades have stopped.

Flight Visibility: The visibility forward from the cockpit of an aircraft in flight.

Ground Visibility: The visibility at an aerodrome, as reported by an accredited observer.

Heading: The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid).

Height: The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

Identification Beacon: An aeronautical beacon emitting a coded signal by means of which a particular point of reference can be identified.

IFR: The symbol used to designate the Instrument Flight Rules.

IFR Flight: A flight conducted in accordance with the instrument flight rules.

IMC: The symbol used to designate Instrument Meteorological Conditions.

Incident: An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Instrument Flight Rules: The instrument Flight Rules require an aircraft to be flown:

a) **in controlled airspace**:

(i) in accordance with stipulated minimum heights; a flight plan must also be filed, and the aircraft flown in accordance with ATC clearances, departure and approach procedures.

(ii) in accordance with the flight plan; position and level reports must be submitted to ATC as required.

b) **outside controlled airspace:**

(i) in accordance with stipulated minimum heights.

(ii) in accordance with the quadrantal or semi-circular rules.

Instrument Meteorological Conditions (IMC): Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for Visual Meteorological Conditions.

Instrument Runway: One of the following types of runway intended for the operation of aircraft using instrument approach procedures :

a) Non-precision approach runway.

b) Precision approach runway.

Landing Area: That part of a movement area intended for the landing or take-off of aircraft.

Landing Direction Indicator: A device to indicate visually the direction currently designated for landing and for take-off.

Level: A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

Maintenance Release: A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner, either in accordance with the approved data and the procedures described in the maintenance organisation's procedures manual or an equivalent system.

Manoeuvring Area: That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Marker: An object displayed above ground level in order to indicate an obstacle or delineate a boundary.

Missed Approach Procedure: The procedure to be followed if the approach cannot be continued.

Movement Area: That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

Night - I.C.A.O: The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate Authority.

Night - UK: The UK Air Navigation Order (ANO) defines night as : the time from half an hour after sunset until half an hour before sunrise (both times inclusive), sunset and sunrise being determined at surface level.

NOTAM: A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Obstacle: All fixed (whether temporary or permanent) and mobile objects which are located on an area intended for the surface movement of aircraft or which extend above a defined surface intended to protect aircraft in flight.

Operator: A person, organisation or enterprise engaged in or offering to engage in an aircraft operation.

Pilot-In-Command - ICAO: The pilot designated by the operator, or, in the case of general aviation, the owner as being in command of and charged with the safe conduct of the flight. The Pilot-in-Command is responsible for the operation and safety of the aircraft.

Pilot-In-Command - UK: A person who for the time being is in charge of the piloting of the aircraft without being under the direction of any other pilot in the aircraft.

Pressure Altitude: An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the ICAO Standard Atmosphere.

Prohibited Area: An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

Radar Vectoring: Provision of navigational guidance to aircraft in the form of specific headings, based on the use of radar.

Radiotelephony: A form of radio communication primarily intended for the exchange of information in the form of speech.

Reporting Point: A specified geographical location in relation to which the position of an aircraft can be reported.

Rescue Coordination Centre (RCC): A unit responsible for promoting efficient organisation of search and rescue services and for coordinating the conduct of search and rescue operations within a Search and Rescue Region.

Restricted Area: An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

Runway: A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Runway-Holding Position: A designated position intended to protect a runway or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorised by the aerodrome control tower.

Runway Visual Range (RVR): The range over which the pilot of an aircraft on the centre line or a runway can see the runway surface, markings or the lights delineating the runway or identifying its centre line.

Search and Rescue Region: An area of defined dimensions within which search and rescue services are provided.

Shoulder: An area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface.

SIGMET Information: Information used by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather which may affect the safety of aircraft operations.

Signals Square: An area on an aerodrome used for the display of ground signals.

Special VFR Flight: A VFR flight cleared by an Air Traffic Control Unit to operate within a control zone in meteorological conditions below VMC.

State of Manufacture: The State having jurisdiction over the organisation responsible for the final assembly of the aircraft.

State of Occurrence: The State in the territory of which any accident or incident occurs.

State of Registry: The State on whose register an aircraft is entered.

Stopway: A defined rectangular area on the ground at the end of the Take-Off Run Available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

Taxiing: Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

Taxiway: A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another.

Taxiway Intersection: A junction of two or more taxiways.

Terminal Control Area (TMA): A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

Threshold: The beginning of that portion of the runway usable for landing.

Touchdown Zone: The portion of a runway, beyond the threshold, where it is intended that landing aeroplanes first contact the runway.

Track: The projection on the Earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

Traffic Information: Information issued by an Air Traffic Services Unit to alert a pilot

to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.

Transition Altitude: The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.

Transition Layer: The airspace between the Transition Altitude and the Transition Level.

Transition Level: The Transition Level is the lowest available Flight Level above the Transition Altitude.

Uncertainty Phase: A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

VFR: The symbol used to designate the Visual Flight Rules.

VFR Flight: A VFR Flight is a flight during which the prevailing weather conditions enable a pilot to conduct the flight, and to navigate, by reference to ground features. VMC must prevail for a flight to be conducted in accordance with the Visual Flight Rules.

Visibility: The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent, unlighted objects by day, and prominent lighted objects by night.

Visual Flight Rules: The Visual Flight Rules require an aircraft to be flown in accordance with the VMC minima appropriate to the classification of airspace in which it is flying.

Visual Meteorological Conditions (VMC): Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.

Waypoint: A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation.

JAR-FCL PPL THEORETICAL KNOWLEDGE SYLLABUS

AIR LAW

The table below contains the principal topics and subtopics from the current outline syllabus for the theoretical examination in **Air Law** for the **Private Pilot's Licence**, as published in **JAR-FCL 1**. Syllabuses may be modified, so always check the latest examination documentation from your **national civil aviation authority**, or from **JAR-FCL/EASA**.

AIR LAW	
LEGISLATION	
The Convention on International Civil Aviation	
The International Civil Aviation Organisation	
Articles of the Convention	Sovereignty; Territory; Flight over territory of Contracting States; Landing at customs airports; Applicability of air regulations; Rules of the air; Entry and clearance regulations of Contracting States; Search of aircraft; Facilitation of formalities; Customs and immigration procedures; Customs duty; Documents to be carried in aircraft; Use of aircraft radio equipment; Certificate of airworthiness; Licences of personnel; Recognition of certificates and licences; Journey log books; Cargo restrictions; Restrictions on use of photographic equipment; Adoption of international standards and procedures; Endorsement of certificates and licences; Validity of endorsed certificates and licences.
ANNEXES TO THE CONVENTION	
Aircraft nationality and registration marks:	Definitions; Aircraft registration marks; Certificate of Registration; Identification plate.
Airworthiness	Definitions; Certificate of Airworthiness (C of A); Continuing airworthiness; Validity of C of A; Instruments and equipment; Aircraft limitations and information.
Rules of the air:	Definitions; Applicability; General rules; Visual Flight Rules; Signals; Interception of civil aircraft.

Air traffic regulations and Air Traffic Services:	Definitions; Objectives of air traffic services; Classification of airspace; Flight Information Regions, Control Areas and Control Zones; air traffic control services; Flight Information Service; Alerting Service; Visual Meteorological Conditions; Instrument Meteorological Conditions; in-flight contingencies.
Aerodrome data:	Definitions; Conditions of the movement area and related facilities; Visual aids for navigation; Indicators and signalling devices; Markings; Lights; Signs; Markers; Signal area; Visual aids for denoting obstacles; Marking of objects; Lighting of objects; Visual aids for denoting restricted use of areas; Emergency and other services; Aerodrome ground lights and surface marking colours; Colours for aeronautical ground lights; Colours for surface markings.
PROCEDURES FOR AIR NAVIGATION SERVICES - AIR TRAFFIC MANAGEMENT	
General provisions:	Definitions; ATS operating practices; Flight plan, clearances and information; Control of air traffic flow; Altimeter setting procedures; Wake turbulence information; Meteorological information; Air reports (AIREP).
Area Control Service:	Separation of controlled traffic in the various classes of airspace; pilots, responsibility to maintain separation in VMC; Emergency and communications failure procedures by the pilot; Interception of civil aircraft.
Approach Control Service:	Departing and arriving aircraft procedures in VMC.
Aerodrome Control Service:	Function of aerodrome control towers; VFR operations; Traffic and circuit procedures; Information to aircraft; Control of aerodrome traffic.
Flight Information and Alerting Service	Air traffic advisory service; Objectives and basic principles.

JAA REGULATIONS	
General requirements:	1.025 – Validity of licences and ratings; 1.035 – Medical fitness; 1.040 – Decrease in medical fitness; 1.050 – Crediting of flight time; 1.065 – State of licence issue.
Student pilots:	1.085 – Requirements; 1.090 – Minimum age; 1.095 – Medical fitness.
Private pilot licences:	1.100 – Minimum age; 1.105 – Medical fitness; 1.110 – Privileges and conditions; 1.115 – Ratings for special purposes; 1.120 – Experience and crediting; 1.125 – Training courses; 1.130 – Theoretical knowledge examinations; 1.135 – Skill tests.
Instrument Rating:	1.175 – Circumstances in which an instrument rating is required
Type and Class Ratings:	1.215 – Division of Class Ratings; 1.225 – Circumstances in which type or class ratings are required; 1.245 – Validity, revalidation and renewal.
Instructor ratings:	1.300 – Instruction – general.

ANSWERS TO AIR LAW QUESTIONS

Chapter 1 Aviation Law (ICAO)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	b	a	c	d	a	a	b	a	b	a	c	d

Question	13	14	15	16	17	18	19	20	21	22	23
Answer	c	b	c	d	b	c	a	d	b	c	c

Chapter 2 Rules of the Air (ICAO)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	a	c	d	b	b	a	b	c	d	d	b	b

Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer	a	a	b	a	a	d	b	d	b	b	b	b

Question	25	26	27	28	29	30	31	32	33
Answer	c	a	b	b	b	a	c	c	b

Chapter 3 Registration (ICAO)

Question	1	2	3	4	5	6	7
Answer	b	c	c	d	d	c	d

Chapter 4 Airworthiness (ICAO)

Question	1	2	3	4	5	6	7	8	9
Answer	b	d	c	d	c	c	a	b	b

Chapter 5 Airspace Division and Air Traffic Services (ICAO)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	b	c	c	c	a	c	c	b	d	b	b	a

Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer	a	d	d	a	a	d	b	b	a	d	b	d

Question	25	26
Answer	b	b

Chapter 6 Flight Plans and Clearances (ICAO)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	c	b	d	c	a	a	a	b	c	d	d	d

Question	13	14
Answer	b	b

Chapter 7 Aeronautical Information (ICAO)

Question	1	2	3	4	5
Answer	c	d	d	a	b

Chapter 8 Separation (ICAO)

Question	1	2	3	4	5	6	7	8	9	10
Answer	c	d	a	c	b	a	c	b	b	c

Chapter 9 Aerodromes (General)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	d	a	c	b	b	c	a	d	d	c	d	b

Question	13	14	15	16	17	18	19	20	21
Answer	a	a	b	c	d	c	b	a	b

Chapter 10 Air Law (UK)

No Questions.

Chapter 11 Rules of the Air (UK)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	c	b	d	a	c	a	a	d	c	a	d	c

Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer	a	d	c	b	d	b	b	a	c	d	b	c

Question	25	26	27
Answer	b	c	b

Chapter 12 Registration

Question	1	2	3	4	5	6	7	8	9	10
Answer	b	a	c	d	d	b	a	c	c	d

Chapter 13 Airworthiness

Question	1	2	3	4	5	6	7	8	9	10
Answer	d	a	c	d	b	b	c	d	c	c

Chapter 14 Airspace Division and Air Traffic Services (CAA)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	c	d	c	b	b	a	c	c	c	c	d	d

Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer	b	c	a	c	b	d	b	c	c	d	b	d

Question	25	26	27	28
Answer	b	d	b	d

Chapter 15 Flight Planning and Clearances

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	b	a	b	a	d	a	c	d	d	d	b	c

Question	13
Answer	d

Chapter 16 Aeronautical Information (CAA)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	a	d	c	b	d	b	c	d	a	b	b	c

Question	13	14	15	16	17	18	19
Answer	c	b	b	d	c	b	a

Chapter 17 Separation (CAA)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	d	a	d	c	b	b	c	a	b	c	d	b

Question	13	14	15
Answer	d	c	c

Chapter 18 Obstacles (General)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	b	a	c	c	b	b	b	c	a	d	c	b

Question	13	14	15	16	17	18	19	20
Answer	a	b	d	b	d	c	c	b

Chapter 19 Altimeter Setting and Procedures (General)

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	c	c	d	d	b	a	b	a	b	c	c	b

Question	13	14	15	16	17	18	19	20	21	22
Answer	c	b	b	d	a	c	a	d	b	b

Annex A General Lights and Signals

Question	1	2	3	4	5	6
Answer	d	c	a	d	b	a

Annexe B JAA Licensing

Question	1	2	3	4	5	6	7	8	9	10	11	12
Answer	a	c	a	c	a	d	d	b	c	b	b	c

Question	13	14	15	16	17	18	19	20	21	22	23	24
Answer	a	c	b	d	c	b	a	b	d	c	a	d

Question	25	26	27	28	29	30	31
Answer	c	b	b	c	a	b	a

For your convenience the ICAO Air Law and United Kingdom Air Law sections have been indexed separately.

International (ICAO) AIR LAW INDEX

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