Pilot Exam: Questions and Answers.
Mark Ashton Smith, Feb-March 2006

Air Law and Navigation.

1. Name the official sources, documents, and promulgation methods of UK aviation law.

Source and documents: Aviation law is enacted by Parliament. The main Act of Parliament regulating aviation in the UK is the Civil Aviation Act 1982. The independent public corporation that regulates all aspects of aviation in the UK is the Civil Aviation Authority (CAA). The Secretary of State for Transport is accountable to Parliament for the CAA's proper discharge of its duties. The Aviation Directorate of the Department for Transport (Manger = Sandra Webber[1]) sponsors the CAA, and there are close and frequent contacts with the Authority across the range of its responsibilities.

The Secretary of State (in consultation with the Secretary of State for Defence where appropriate) sets the policy framework for the CAA by:

- agreeing overall priorities and objectives each year with the CAA;
- monitoring the performance of the CAA in relation to agreed objectives;
- appointing the Chairman and members of the Board of the CAA;
- setting the terms and conditions of such appointments (with consent of HM Treasury);
- appointing the CAA's external auditors;
- issuing any general guidelines or specific directions, including an annual accounts direction;
- laying the annual report and accounts before Parliament.

Promulgation methods: Law is published in statutory documents – e.g. the Air Navigation Order, the Air Navigation Regulations, and the Rules of the Air Regulations[2]. These documents are published by the CAA[3].

The National Air Traffic Services (NATS) also publishes "information essential to air navigation" through its Aeronautical Information Service (AIS)[4], including

1. Aeronautical Information Package (UK AIP).
2. NOTAMs ('Notices to Airmen').
3. Aeronatical Information Circulars[5].

Example of a NOTAM

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EGPX
NAVW: Q)EGPX/QWELW/IV/BO/W/000/550/5850N00330W120
FROM 06/02/27 09:00 TO 06/03/09 16:00
D) FEB 27-MAR 02 0900-1100 1400-1600 AND 1800-2030, MAR 03 0900-
1100 AND 1400-1600, MAR 06-08 0900-1100 1400-1600 AND 1800-2030,
MAR 09 0900-1100 AND 1400-1600
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[1] http://www.dft.gov.uk/structure/aviation/default.asp
[2] http://www.caa.co.uk/docs/33/CAP393.PDF
[3] http://www.caa.co.uk/docs/33/CAP393.PDF
[4] http://www.ais.org.uk/aes/login.jsp
[5] http://www.ais.org.uk/aes/pubs/aip/pdf/aic/4Y117.PDF

E) AUS 06-02-0005/410/AS4
NEPTUNE WARRIOR 061. INTENSE AERIAL ACTIVITY WILL TAKE PLACE WI AREA BOUNDED BY 5940N 00130W-5910N 00100W-5747N 00100W-5740N 00131W-5740N 00258W-5819N 00553W-5950N 00602W-ORIGIN (FAOR NORTH). LARGE FORMATIONS OF FAST JET ACFT WILL CONDUCT HIGH ENERGY MANOUEVRES AND MAY NOT BE ABLE TO COMPLY WITH RULES OF THE AIR. ROUTINGS THROUGH THE UIR OF THIS AREA MAY BE TACTICALLY AVAILABLE ON REQUEST FROM SCOTTISH AIRWAYS OR SHANWICK OCEANIC. ACN 06-02-0005 DATED 6 FEB 06 REFERS.
CONTACT 01436 674321 EXT 4373/4379.

Note that when you try to get the 'free' AIP documents, you are told only that 'this information is for pre-flight planning purposes only'. And it's difficult to know how free-fliers might use the NOTAMs. Do some free-fliers make use of them?

2. What is the law regarding Royal Flights?

Applies to aircraft carrying principle members of the Royal Family (William & Harry included?)

Fixed wing. Conducted in existing airspace where possible.

Otherwise will issue a NOTAM for 'Purple Airspace' is set up (10nm wide, vertical limits set in NOTAM). This airspace is Rule 21 (IFR only – not for paragliders!).

Helicopters. No special procedures are set up.

3. What is the law regarding glider radios?

Airband radio. (AM frequency).

To legally operate one of these we must comply with these regulations:

1. The radio must be **type approved** by the CAA.
2. The owner must have a **station licence** for that radio. (to obtain one go to www.caa.co.uk and search for 'hang glider')
3. The pilot must either possess an Operator's (R?T) licence or only use one of the following frequencies:

   118.675 MHz. A dedicated paragliding and hang gliding frequency, for anywhere in the UK FIR (class G), up to and including 5000ft AMSL.

   5 'sport aviation' frequencies (129.9 MHz, 129.95 MHz, 130.1 MHz, 130.125 MHz and 130.4 MHz).

   the international distress frequency of 121.5.

2m amateur radios. Many FM frequencies (typically 144 - 146 MHz). It's illegal to use a 2m set from the air, whether you are a licensed amateur or not. (But we do.)

4. What are the different classes of airspace?

5. What is the basic structure of Zones, Areas and Airways?

6. **What are the dimensions of MATZs and ATZs?**

7. **How are the different altimeter settings – QFE, QNH, and 1013.2 mb – used?**

8. **What are the rules of the air? – particularly for low-flying and aerial collision avoidance.**

9. **Define VMC and VFR (minima, rules).**

10. **Define IMC and IFR (basic differences from VMC rules).**

10. **What are the legal definitions of night, sunset and sunrise, and the flying restrictions related to them?**

11. **What is deviation and variation on a compass?**

12. **What are some aviation warning signs?**

13. **What do the following stand for? AGL, AIAA, AMSL, ANO, ASR, ATC, ATZ, CTA, CTR, FIR, FL, HIRTA, IFR, IMC, MATZ, AFE, ANH, SRA, SRZ, TMA, VFR, VMC.**

14. **Distinguish between types of airspace that permit glider entry and those that don't (e.g. AIAAs, MATZs, and Danger Areas).**

Meteorology.

1. **What is the relationship between wind direction and areas of high and low pressure?**

2. **Describe in detail a cold front and a warm front (typical clouds, pressure changes, wind changes).**

3. **Describe in detail convection – the birth and development of a thermal, through to plotting the progress of the thermal given the ELR and initial temperature.**

4. **Define meteorological terms such as stability, instability, veer, back, ELR, DALR, SALR, tephigram, anabatic, katabatic.**

5. **Describe the usual conditions associated with high and low pressure weather systems.**

6. **What are the causes of valley winds throughout the day, sea breezes, sea-breeze fronts, wave lift and fog (of various types).**

7. **Interpret a synoptic chart. Describe the current weather at selected locations and forecast likely changes.**

8. **Link cloud types to precipitation.**

Flight Theory and Instruments.

1. **Explain in detail how a wing creates lift, giving the relevance of venturi tubes and Bernoulli's theorem.**

2. **Define chord line, angle of attack, aspect ratio, centre of pressure.**

3. **Describe the aerodynamics of a stall.**

4. **Describe factors affecting stability in pitch, roll and yaw.**

5. **What is the relationship between glide ratio and l/d ratio.**

6. **What is the effect of ballast on the aerodynamics of a glider?**

7. **Name the forces on a glider in steady flight and explain their relationship.**

8. **Name the various types of drag and explain their causes.**

9. **Describe the relationship between the induced, parasitic and total drag and airspeed using drag curves.**

10. **Demonstrate use of a polar curve.**

11. **What are the basic working principles of altimeters and variometers?**

12. **What does 'total energy' and 'airmass' mean in connection with variometers?**