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### **1 INTRODUCTION**

a) Although this guide is mainly intended for Private Pilots of fixed wing aircraft, much of the advice will be relevant to **all** **pilots**, whatever their experience or the type of aircraft they fly. However, there are specific leaflets giving more detailed advice for helicopter (no. [17](#)) and balloon (no. [16](#)) pilots.

b) Any review of General Aviation Accidents shows that most should not have happened. They are a result of a combination of the following:

- use of incorrect techniques;

- lack of preparation before flight;
- being out of practice;
- lack of appreciation of weather;
- overconfidence;
- flying illegally or outside licence privileges;
- failing to maintain control;
- a complacent attitude; and
- the 'it will be alright' syndrome.

c) Comprehensive **Knowledge**, careful **Preparation** and frequent flying **Practice** are key elements in developing 'Good Airmanship' which is the best insurance against appearing as an accident statistic.

## 2 KNOWLEDGE - REPORTING

a) "Learn from the mistakes of others; you might not live long enough to make all of them yourself".

b) Share your knowledge and experience with others, preferably by reporting to the CAA, your parent organisation, or the Confidential Human Factors Incident Reporting Programme (CHIRP), anything from which you think others could learn. **Your report could prevent someone else's accident.** Photographs often help to illustrate a problem.

c) Improve your knowledge by reading the CAA's GASIL, published monthly except January, the Air Accident Investigation Branch's monthly Bulletin, the General Aviation Safety Council's quarterly Bulletin and CHIRP's GA Feedback leaflet.

Details of reported light aircraft occurrences are held by the CAA's Safety Investigation & Data Department, and are available for safety purposes.

d) More specific information is available in other Safety Sense Leaflets, in Aeronautical Information Circulars (available by subscription or free from the AIS web site [www.ais.org.uk](http://www.ais.org.uk)) particularly the pink Safety ones, and in other publications.

## 3 STATISTICS

a) There is an average of one fatal GA accident a month in the United Kingdom.

b) The main fatal accident causes during the last 20 years have been:

- continued flight into bad weather, including impact with high ground and loss of control in IMC;

- loss of control in visual met conditions, including stall/spin;
- low aerobatics and low flying;
- mid-air collisions (sometimes each pilot knew the other was there);
- runway too short for the aircraft's weight or performance; and
- colliding with obstacles, perhaps being too low on the approach.

c) A high proportion of stall/spin fatal accident pilots were not in good flying practice.

d) Loss of control in flight is the major cause of fatal accidents in gliding and microlighting.

e) The main causes of twin-engined aircraft fatal accidents were:

- pressing on into bad weather (often to aerodromes with limited navigational facilities) resulting in controlled flight into terrain or loss of control IMC; and
- loss of control VFR particularly following engine failure

## 4 REFRESHER TRAINING

Revise your basic knowledge and skills by having a regular flight, at least every year, with an instructor which includes:

- steep turns; and
- slow flight and stalls (clean and with flap) so that you recognise buffet, pitch attitude, control loads etc.

*Note: in a level 60° banked turn, the stall speed increases by about 42% - a 50 kt straight and level stall becomes 71 kt.*

Practise at a safe height.

- If the aircraft is aerobatic or cleared for spinning, practise full spins as well as incipient spin recovery from a safe height. Aim to recover by 3000 feet above ground.
- Practise forced landing procedures
- Instrument flying and cloud avoidance.
- Take-offs and landings, including normal, cross-wind, flapless and short.
- If you fly a twin, **practise engine out procedures** and power off stalls. Manufacturers quote a minimum safe speed for flight with one engine inoperative,  $V_{MCA}$ . Age and modifications may increase this for your aircraft.

## 5 **LIMITATIONS**

a) You must know the aircraft's limitations and **HEED THEM**. If it is placarded 'NO AEROBATICS', it means it!

b) **Know your own limitations**; if you do not have a valid Instrument or IMC Rating, then you must fly clear of cloud, in sight of the surface and with a flight visibility of 3000 metres. If not in practice, you are not as good as you were!

## 6 **PREPARATION - DOCUMENTS**

a) Make sure that your personal paperwork (licence/rating, Certificate of Test/Experience and medical), is up to date. Also check that the aircraft's documents, including Certificates of Airworthiness/Permit to Fly, Maintenance Release and Insurance, are current.

b) Make sure that the Check List you use conforms to the Flight Manual of that aircraft.

## 7 **UNFAMILIAR AIRCRAFT**

a) Before you fly a new aircraft type, ensure any 'Differences Training' is completed.



b) Before you fly either a new aircraft type, one you have not flown for a while or one you do not fly often, study the Pilot's Operating Handbook/Flight Manual and be thoroughly familiar with:

- airframe and engine limitations;
- normal and **emergency** procedures;
- operating, stall and best glide speeds;
- weight and balance calculation;
- take-off, cruise and landing performance.

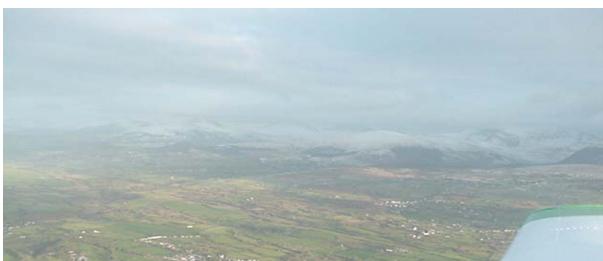
c) Familiarise yourself with the external and ground checks, cockpit layout and fuel system, e.g. don't confuse the carb heat control with the mixture control.

d) Even if not legally required, try to have one or more thorough check flight with an instructor, particularly if converting to a tail wheel type. (In the case of a single seat aircraft, make thoroughly pre-briefed exploratory flights.) Include the items in paragraph 4, Refresher Training.

e) If you have not flown the type in the last six months, treat it as 'new'. Many clubs require a check-flight if you have not flown the type in the last 28 days.

## 8 WEATHER

a) Get an aviation weather forecast, heed what it says and make a carefully reasoned GO/NO-GO decision. Do not let 'Get-there/home-it-is' affect your judgement and do not worry about 'disappointing' your passenger(s). Establish clearly in your mind the current en-route conditions, the forecast and the 'escape route' to good weather. Plan an alternative route if you intend to fly over high ground where cloud is likely to lower and thicken.



b) Note the freezing level. Don't forget to check on crosswind at the destination.

c) The various methods of obtaining aviation weather (including codes) are described in the booklet '[GET MET](#)', available free from the Met Office. Aerodrome and area forecasts and reports are freely available on the met office website [www.metoffice.gov.uk](http://www.metoffice.gov.uk).

d) Know the conditions that lead to the formation of carburettor or engine icing and stay alert for this hazard. Check carb heat at top of climb and periodically use it in the cruise and with the first indication of a loss of power due to icing; once formed it may take more than 15 seconds of heat to melt the ice. Check carb heat during pre-landing checks and use it at low power settings as directed in the Pilot's Operating Handbook/Flight Manual. (See SafetySense Leaflet [14](#) 'Piston Engine Icing'.)

## 9 VFR NAVIGATION

a) Use appropriate current aeronautical charts. (See SafetySense Leaflet [5](#) 'VFR Navigation'.) Amendments to charts are available on the website [www.caa.co.uk/dap](http://www.caa.co.uk/dap).

b) Check NOTAMs, Temporary Navigation Warnings, AICs etc. for changes issued since your chart was printed or which are of a temporary nature, such as a closed runway, an air display, navaid or ATC frequency change. These are available on the AIS website at [www.ais.org.uk](http://www.ais.org.uk).

c) Information on Temporary Restricted or Controlled Airspace, Red Arrows displays and Emergency Restrictions is available on Freephone **0500 354 802**, updated daily, and also on 020 8750 3939.



d) Prepare your Route Plan thoroughly, with particular reference to minimum flying altitude and suitable diversions. Familiarise yourself with the geographical features, time points, airspace en-route and frequencies.

e) Note masts and other obstructions in planning your minimum flying altitude; note Maximum Elevation Figures (MEF) printed on the charts.



- f) Allow extra height over hilly terrain, particularly in windy conditions, to minimise turbulence and the effects of down draughts.
- g) Plan to reach your destination at least one hour before sunset unless qualified and prepared for night flight. Note aerodrome operating hours.
- h) In any aircraft, the minimum height over a congested (i.e. built-up) area is not less than 1000 ft above the highest object within 600 metres. In any aircraft other than a helicopter, you must not fly over congested areas without sufficient height to safely alight clear of the area in the event of engine failure. This could be higher than 1000 ft (note: Permit to Fly aircraft may not be allowed over congested areas).
- i) Do not plan to fly below 1000 ft agl, (where most military low flying takes place – see *SafetySense Leaflet 18 'Military Low Flying'*), unless necessary. If your engine fails you may need time to select a safe landing field.
- j) Know the procedure if you get lost, see paragraph 25.
- k) If you use GPS to back up your visual navigation, load and check the route beforehand. Double-check any way-points when working them out and entering them. Progress **must** be monitored by map reading and not by implicitly trusting the GPS. (See *SafetySense Leaflet 25*.)

## 10 **RADIO**

- a) Know what to do in the event of radio failure, including when flying Special VFR in controlled airspace. Know your way round your radio switches.
- b) Note all useful radio frequencies, including destination and diversion aerodromes, VOLMET, LARS, Danger Area Crossing Service etc.
- c) Note the frequencies and morse ident of radio NAVAIDs for back-up to the visual navigation.
- d) Remind yourself about radio procedures, phraseology etc. (See CAP 413 'Radiotelephony Manual' and SafetySense Leaflet 22.)

## 11 **WEIGHT AND BALANCE**

- a) Use the **actual** empty weight and CG from the latest Weight and Balance Schedule of the specific aircraft you are flying. Aircraft get heavier due to extra equipment, coats of paint etc. Use people's actual weights, too.



- b) Check that the aircraft maximum weight is complied with. If too heavy, you **must** reduce the weight by off-loading passengers, baggage or fuel.
- c) Check that the CG is within limits for take-off and throughout the flight. If your calculations show that it will not stay within the approved range, including the restricted range for spinning or aerobatics, you must make some changes.

d) **Never** attempt to fly an aircraft which is outside the permitted weight/CG range and performance limitations. It is extremely dangerous (sudden loss of control likely), as well as illegal, invalidates the C of A and almost certainly your insurance. (See *Safety Sense Leaflet 9 'Weight and Balance'*.)

## 12 PERFORMANCE

a) Make sure that the runways you are going to operate from are long enough for take-off and landing. Use the Pilot's Operating Handbook/Flight Manual to calculate the distances that you need. Check for any CAA Supplements that may downgrade the performance.

b) Any factors given for elevation, temperature, slope, grass, snow, tail wind etc. are all cumulative and must be **multiplied**, e.g. 1.3 x 1.2 etc.

c) The performance figures given in the Handbook/Manual were obtained by a test pilot on a new aircraft, so in addition to the published factors, **apply a safety factor** of 1.33 for take-off and 1.43 for landing. These give acceptable safety margins, and will offset an out-of-practice pilot/tired engine. On a few aircraft these may have been included in the manufacturer's information as 'factored' data. (See *SafetySense Leaflet 7 'Aeroplane Performance'*.)

d) Short wet grass is slippery and may need a factor of up to 1.6!



## 13 FUEL PLANNING

a) Always plan to land by the time the tanks are down to the greater of  $\frac{1}{4}$  tank or 45 minutes' cruise flight, but don't rely solely on gauge(s) which may be unreliable. Remember, headwinds may be stronger than forecast and frequent use of carb heat will reduce range.

b) Understand the operation and limitations of the fuel system, gauges, pumps, mixture control, unusable fuel etc. and remember to lean the mixture if it is permitted.

c) Don't assume you can achieve the Handbook/Manual fuel consumption. As a rule of thumb, due to service and wear, expect to use **20% more fuel** than the 'book' figures.

## 14 DESTINATION

a) Check for any special procedures and activities at your destination such as gliding, parachuting, or microlighting. Update the UK Aeronautical Information Publication (UK AIP) or other Flight Guides with NOTAMs from the AIS website at [www.ais.org.uk](http://www.ais.org.uk) or the AIS fax pollback numbers.

b) If your destination is a strip, remember that the environment may be very different from the licensed aerodrome at which you learnt to fly, or from which you normally operate. There may be hard to see cables or other obstructions on the approach path, or hills, trees and buildings close to the strip giving wind shear and/or unusual air currents.

c) Before going to a strip, it is suggested that you are checked out by an instructor or someone who knows the strip well. If you can't arrange either, go by road and have a look at the potential problems for different wind/surface conditions. Assess the slope; it may be visually deceptive. (See *SafetySense Leaflet 12 'Strip Sense'*.)

d) You **must** obtain permission by telephone (unless otherwise notified) if the destination is "Prior Permission Required (PPR)". Even if permission is not required, if flying non-radio, always phone to find out the procedures.

e) Prepare a Flight Plan for filing on the day if you are going over a sparsely populated area, or more than 10 nm from the UK coast. (See *UK AIP Enroute [ENR] 1.10 and Safety Sense Leaflet 20*.)

## **15 FLYING ABROAD**

a) Make sure you are conversant with the aeronautical (and customs) regulations, charts (including scale and units, e.g. feet or metres), airspace restrictions etc. for each country you are flying over. Their individual AIS website may help. Remember, an IMC rating is not valid outside the UK.

b) Ensure you know how to find weather forecasts and reports for your return flight.

c) Take the aircraft documents, your licence, and a copy of 'Interception Procedures' (AIP ENR 1.12 and *Safety Sense Leaflet 11*).

d) Before crossing an international FIR boundary you must file a Flight Plan. Check that it has been accepted and the DEParture message sent once you are airborne. (See *SafetySense Leaflet 20 'VFR Flight Plans'*.)

e) Check the Terrorism Act's restrictions on flights to and from Ireland, Channel Isles and Isle of Man (UK AIP GEN 1.2.1).

f) Ensure you have informed Customs and Immigration if you are returning from an EU country and not using a Customs aerodrome. See AIP GEN 1.2.1.2 (1.2.1.3 covers flight from non-EU countries).

g) In some countries, e.g. Germany and France, it is a legal requirement to have a 760 channel radio which can transmit and receive on frequencies between 118 and 137 MHz.

## **16 FLIGHT OVER WATER**

a) The weather over the sea can often be very different from the land, e.g. sea fog.

b) When flying over water, everyone in a single-engined aircraft should, as a minimum, **wear** lifejackets. In the event of an emergency there will be neither time nor space to put one on.



c) The water around the UK coast is very cold in winter and cold in summer. Survival time in normal clothing may be as low as 15 minutes (about the time needed to scramble an SAR helicopter but not for it to reach you). A good quality insulated survival suit, with the hood up and well sealed, should provide over 3 hours survival time. In water, the body loses heat 100 times faster than in cold air.

d) In addition, take a life-raft; it's heavy, so re-check weight and balance. A life-raft is much easier to see and will help rescuers find you. It should be properly secured in the aircraft, but easily accessible - you will not have much time.

e) Make sure that lifejackets, survival suits and life-raft have been tested recently by an approved organisation – they **must be serviceable** when needed.

f) You are strongly urged to carry an approved Emergency Locator Transmitter or a 406 MHz Personal Locator Beacon and flares.

g) Remain in contact with an appropriate aeronautical radio station.

h) Know the ditching procedure.

i) Pilots and passengers who regularly fly over water are advised to attend an underwater escape training and Sea Survival Course. (See SafetySense Leaflet [21](#) 'Ditching').

## 17 PILOT FITNESS

a) Don't fly when unfit – it is better to cancel a flight than to wreck an aircraft or hurt yourself! (See Safety Sense Leaflet [24](#) 'Pilot Health'.) Are you fit to fly? – Check against the 'I'm Safe" list below.

**I** Illness (any symptom).

**M** Medication (your family doctor may not know you are a pilot).

**S** Stress (upset following an argument?).

**A** Alcohol/Drugs.

**F** Fatigue (good night's sleep etc.).

**E** Eating (food keeps blood-sugar correct).

b) Plan to use oxygen when flying above 10,000 ft. Use it at lower altitude when flying at night or if you are a smoker (more carbon monoxide in the blood). **Do not smoke** when using oxygen.

c) If you need to wear spectacles or contact lenses for flying, make sure that the required spare pair of glasses is readily accessible.

d) Wear clothes that cover the limbs and will give some protection in the event of fire. Avoid synthetic material which melts into the skin. In winter, take additional warm clothing in case of heater failure or a forced landing.

e) Use the seat belts/harnesses provided for everyone's protection. Wear a helmet in open-cockpit aircraft.

## 18 **PRACTICE - PREFLIGHT INSPECTION**

a) Remove tie-downs, control locks, pitot cover and tow bar, then complete a thorough pre-flight inspection. Use the Check List unless you are very familiar with the aircraft.

b) Remember, magnetos are **live** unless properly earthed. Any damaged wiring may result in the engine suddenly bursting into life unexpectedly, especially if the propeller is moved. Take precautions such as closing the throttle, tightening the friction, and chocking the wheels before touching a propeller if you have to – and keep fingers away from the edges.



c) Determine **visually** that you have enough fuel of the right type. If necessary, use a dip-stick to check fuel levels. Personally supervise re-fuelling. Don't let anyone confuse AVGAS and AVTUR. Make sure the filler caps are properly secured. With the fuel selector ON, check fuel drains for water and other contamination. Be aware of the danger of static electricity during re-fuelling.



d) Check engine oil level and if necessary top up with the correct grade; do not over-fill.

e) If you find anything with which you are unhappy, seek further advice.

f) Remove **all** ice, frost, and snow from the aircraft. Even frost spoils the airflow over aerofoil surfaces resulting in loss of lift and abnormal control effects. Beware of re-freezing. Use only authorised de-icing fluids. (SafetySense Leaflet [3](#) 'Winter Flying').

g) Check **visually** that the flying control surfaces move in the correct sense in response to control inputs.

h) Properly secure any baggage so that nothing can foul the flying controls. Beware of loose items, e.g. passengers' cameras

i) The law requires you **must brief** passengers on location and use of doors, emergency exits and equipment, as well as procedures to be followed in the event of an emergency. Personally secure doors and luggage hatches. (Safety Sense Leaflet [2](#) 'Care of Passengers').

j) Confirm all seats are upright for take-off and properly **locked in place**.

## 19 **STARTING ENGINE**

a) Know where to find and how to use the aircraft's fire extinguisher, as well as the location of any others in the vicinity.

b) **Never** attempt to hand swing a propeller (or allow anyone else to swing your propeller) unless you know the proper, safe procedure for your aircraft and situation, and there is a suitably briefed person **at the controls**, the brakes are ON and/or the wheels are chocked. Check that the area behind the aircraft is clear.

c) Use a Check List which details the correct sequence for starting the engine. Make sure the brakes are ON (or chocks in place) and that avionics are OFF before starting engine(s).

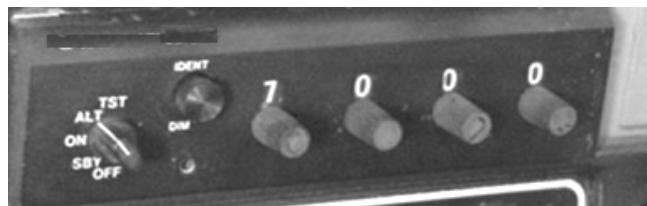
## 20 TAKE-OFF

- a) Never attempt to take off unless you are sure the surface and length available are suitable.
- b) Visually check the approach (to both ends!) and runway are clear before lining up and taking off.
- c) Choose an acceleration check point from which you can stop if the aircraft hasn't achieved a safe speed. If you haven't reached for example 2/3 of your rotate speed by 1/3 of the way along the runway, abandon the take-off!
- d) In the event of engine failure after take-off, achieve and maintain the appropriate approach speed for your height. If the runway remaining is long enough, re-land, and if not, make a glide landing on the least unsuitable area ahead of you. It is a question of knowing your aircraft, your level of experience and practice, and working out beforehand your best options for various heights at the aerodrome in use. Attempting to turn back without sufficient available energy has killed many pilots and passengers. (One day, at a safe height, and well away from the circuit, try a 180° turn at idle rpm and see how much height you lose! – then remember you will probably have more drag, **and** have to turn more than 180°, in a real situation.)



## 21 LOOK OUT

- a) Always keep a good look-out (and listen-out) for other aircraft, particularly over radio beacons and in the vicinity of aerodromes, Visual Reference Points, and navigation 'choke points' between hills and airspace restrictions. Gliders climb in the thermals underneath cumulus clouds, and cruise, often at quite high speed, between them.
- b) The most hazardous conflicts are those aircraft with the least relative movement to your own. These are the ones that are difficult to see **and** the ones you are most likely to hit. Beware of blind spots and move your head or the aircraft to uncover these areas. Scan effectively, and remember faster aircraft may come up behind you. (See SafetySense Leaflet [13 'Collision Avoidance'](#).)
- c) Remember the Rules of the Air, which include flying on the right side of line features and giving way to traffic on your right.
- d) If the aircraft has strobe lights, use them in the air. Especially in a crowded circuit, use landing lights as well.
- e) Spend as little time as possible with your head 'in the office'.
- f) If you have a transponder, select and transmit the conspicuity code 7000 with Mode C (altitude reporting) unless another is appropriate or ATC instruct.



## 22 **AIRSPACE**

a) Do not enter controlled airspace unless **properly authorised**. (See SafetySense Leaflet [27](#) – “Flight in Controlled Airspace”.) You might have to orbit and wait for permission. Keep out of Restricted and Danger Airspace; don’t forget Danger Area Crossing and Information Services.

b) Use the Lower Airspace Radar Service (LARS), available from many aerodromes, particularly on week days. It may prevent you from getting a nasty fright from military or other aircraft. (See SafetySense Leaflet [8](#) ‘Air Traffic Services Outside Controlled Airspace’.)

c) Deconfliction Service can tell you about conflicting aircraft and offer advice to avoid. Traffic Service can give you details of conflicting aircraft, but you have to decide if avoiding action is necessary. Make sure you know which service you are receiving. **Pilots are always responsible for their own terrain and obstacle clearance.**

d) Allocation of a transponder code does not mean that you are receiving a service.

## 23 **EN-ROUTE**

a) Log all important information, including heading changes with the time you make them.

b) Keep looking well ahead and around for indications of possible weather problems, such as cloud between you and the horizon making it appear lower. If you encounter deteriorating weather, turn back or divert early – well before you are caught in cloud. A 180° turn in cloud will not be as easy as in the skill test!



b) Do not attempt to fly between lowering cloud and rising ground. Many pilots have come to grief because a lowering cloud base has forced them lower and lower into the hills. You **MUST** avoid ‘scud running’.

c) If forced into or above cloud, do not fly below your planned Safety Altitude.

d) Don’t overlook en-route checks such as **FREDA** – fuel, radio, engine, **DI** and **altimeter**. ‘Engine’ should include a carb heat check.

## 24 **DIVERSION**

a) Unless you have a valid IMC or Instrument Rating, and are flying a suitably equipped aircraft, you must remain in sight of the surface. Before take-off, make plans for a retreat or diversion to an alternative aerodrome in the event of encountering lowering cloud base or deteriorating visibility. If cloud base lowers to your calculated minimum flying altitude, or in flight visibility drops to 3 km, carry out these plans **immediately**. Turn back before entering cloud. Don’t fly above clouds unless they are widely scattered and you can remain in sight of the surface.

b) Divert to the nearest aerodrome if the periodic fuel check indicates you won’t have your planned fuel reserve at destination.

c) An occasional weather check from VOLMET is always worthwhile.

## 25 LOST

a) If you become unsure of your position, then **tell someone**. Transmit first on your working frequency. If you have lost contact on that frequency or they cannot help you, then change to 121.5 MHz and use Training Fix, PAN or MAYDAY, whichever is appropriate (see [CAP 413 'Radiotelephony Manual'](#)). If you have a transponder, you may wish to select the emergency code, which is 7700. It will instantly alert a radar controller.

b) Few pilots like to admit a problem on the radio. However, if any **2** of the items below apply to you, you should call for assistance quickly, '**HELP ME**':

**H** High ground/obstructions – are you near any?

**E** Entering controlled airspace – are you close?

**L** Limited experience, low time or student pilot (let them know).

**P** Position uncertain, get a 'Training Fix' in good time; don't leave it too late.

**M** MET conditions; is the weather deteriorating?

**E** Endurance – fuel remaining; is it getting short?

c) As a last resort, make an early decision to land in a field while you have the fuel and daylight to do so. Choose a field with care by making a careful reconnaissance. Do not take off again without the landowner's permission, inspecting the aircraft and take-off run carefully, and obtaining a weather update or further advice.

## 26 SPEED CONTROL

a) Good airspeed control can prevent inadvertent stalling or spinning, a major killer in aviation.

b) When landing, aim for the flight handbook speed, or 1.3 times the stall speed with flap, over the threshold, and reduce speed in the round-out. If the headwind is turbulent or gusty, add a margin of, say, 5 kt or half the gust factor, whichever is the greater. If your speed is high, the landing distance required is likely to be more than you calculated. Practise flying your approaches at accurate, calculated airspeeds.

c) A spin occurs when an aircraft is 'out of balance' at the stall, so always practise keeping the ball in the centre.

d) If you have not practised slow flight for some time, get an instructor to accompany you while you do so (at a safe altitude).

e) Do not exceed the limiting speeds for your aircraft. That includes maximum manoeuvring speed  $V_a$ .

f) Do not apply extreme control movements at any time.

g) In aeroplanes with fixed pitch propellers, beware of maximum rpm.

## 27 ENVIRONMENTAL

- a) Few people like aircraft noise and several aerodromes are under threat of closure due to this, so it is vital to be a good neighbour.
- b) Adhere to noise abatement procedures and do **NOT** fly over published or briefed noise sensitive areas near aerodromes.
- c) Select sites for practice forced landings or aerobatics very carefully. **HASELL** includes 'LOCATION'.
- d) When en-route, fly at a height/power setting to minimise noise nuisance, in addition to complying with Rule 5 'Low Flying'.
- e) When flying a variable pitch propeller aircraft, change pitch slowly to avoid excessive noise. When flying twins, synchronise the engines to avoid 'beats'.
- f) Select engine run-up areas to minimise disturbance to people, animals etc.
- g) **NEVER** be tempted to fly low or 'beat up' the countryside.

## 28 WIND & WAKE TURBULENCE

- a) Know the maximum demonstrated cross-wind for the aircraft type you are flying and factor this for your experience and recency.



- b) Remember, that was obtained by a test pilot! If the wind approaches what you have decided is your own limit, be ready to divert.

c) Use the 'Sixth Sense' rule to work out the cross-wind component.

10° off runway = 1/6 of the wind

20° off runway = 2/6 wind

30° off runway = 3/6 wind etc.

d) If there is a cross-wind, the reduced head-wind component will lengthen the take-off and landing runs. You may retain better control on landing by not using full flap, further increasing the landing distance.

e) If another runway which is more into wind is available, use it (after **asking** Air Traffic Control if there is one). You may have to wait a few minutes to fit in with other traffic.

f) When winds or gusts exceed 66% of the aircraft's stall speed (50% for taildraggers), in general, don't go flying! If you have to, use outside assistance for taxiing such as a wing walker. Taxi very slowly when winds exceed 30% of the stall speed (unless the POH specifies otherwise), and be **VERY** careful when the wind is from your rear.

g) On the ground, stay 1000 ft clear of the 'blast' end of powerful aircraft.

h) Beware of wake turbulence behind heavier aircraft on take-off, during the approach or on landing. You should remain 8 nm, or 4 minutes or more, behind most large aircraft. Note that wake turbulence lingers **when wind conditions are very light**. These very powerful vortices are invisible. Heed Air Traffic warnings. (*SafetySense Leaflet 15 'Wake Vortex'*.)



## 29 CIRCUIT PROCEDURES

- a) When joining or re-joining, make your radio call early and keep radio transmissions to the point. Know the non-radio procedures in case of failure. ([CAP 413](#) and SafetySense Leaflet [6](#) ‘Aerodrome Sense’.)
- b) Check that the change from QNH to QFE reduces the altimeter reading by the aerodrome elevation. If landing using QNH, e.g. at a strip, don’t forget to add aerodrome elevation to your planned circuit height.
- c) Use the correct joining procedures for your destination aerodrome. Unless otherwise published, make a standard join from the overhead (see [CAP 413](#) & [poster](#) “Standard Overhead Join”). Check circuit height and direction. Be aware of and look out for other aviation activity such as gliding & parachuting.
- d) Check windsock/signals square or nearby smoke to ensure you land in the right direction. Be very sure of the wind direction and strength before committing yourself to an approach at a non-radio aerodrome.
- e) Make radio calls in the circuit at the proper places. Listen and look for other circuit traffic. Don’t forget pre-landing checks, easily forgotten if you make a straight-in approach.
- f) Be aware of optical illusions at unfamiliar aerodromes with sloping runway or terrain, or with very long, or very wide runways.
- g) Take care where runways can be confused, e.g. 02 and 20. Make sure you know whether the circuit is left- or right-hand, as this will determine the dead side. If in doubt – **ASK**.
- h) In most piston-engined aircraft, apply full carb heat early enough to warm it up BEFORE reducing power.

## 30 LANDING

- a) A good landing is a result of a good approach. If your approach is bad, make an early decision and go-around. Don’t try to scrape in.
- b) Plan to touch down at the right speed, close to the runway threshold, unless the field length allows otherwise. Use any approach guidance (PAPI/VASI) to cross-check your descent.



- c) Go-around if not solidly ‘on’ in the first third of the runway, or the first quarter if the runway is wet grass. However, if the runway is very long, plan your landing to minimise runway occupancy – think of the next user.
- d) Wait until you are clear of the active runway, then stop to carry out the after landing checks. Double check the lever you intend moving is the flaps and NOT the landing gear.
- e) If the clearance between the propeller and the ground is small, or grass is long and hiding obstructions, be especially watchful to prevent taxiing accidents.
- f) If you are changing passengers, shut down the engine. Do not do ‘running changes’; propellers are **very** dangerous.
- g) Remember, the flight isn’t over until the engines are shutdown and all checks completed.
- h) ‘Book in’ and close any Flight Plan, or contact your “responsible person”.

### 31 **SUMMARY**

- Keep in current flying practice, have an annual check-out with particular emphasis on stall recognition and asymmetric practice in twins.
- Get an aviation weather forecast.
- Prepare a thorough Route Plan using the latest charts, check on NOTAMs, Temporary Nav warnings etc.
- Know the aircraft thoroughly.
- Don't over-load the aircraft.
- Make sure the runway is long enough in the conditions.
- Over water in a single-engined aircraft, wear a lifejacket (perhaps also an immersion suit), carry an accessible life-raft.
- Pre-flight properly with special emphasis on fuel/oil contents and flying controls.
- In a single-engined aircraft, bear in mind the consequences of engine failure.
- Maintain a good look-out, scan effectively, be aware of 'threat areas'.
- If the weather deteriorates, or night approaches, make the decision to divert or return early.
- Don't end up in weather outside your ability or licence privileges.
- NEVER descend below your Safety Altitude in IMC.
- Request help early if lost or have other problems, e.g. fuel shortage.
- Keep out of controlled airspace unless you have clearance.
- Make regular cruise checks including fuel contents/selection and carb heat.
- Maintain flying speed, avoid inadvertent stall/spin, don't fly low and slow.
- Always treat propellers as "live".
- Don't do anything stupid - become an old pilot, NOT a bold pilot.

#### **Finally -**

- Pilots exercising GOOD AIRMANSHIP never sit there 'doing nothing', they always think 15 to 20 miles ahead.