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1 INTRODUCTION

a) Although this guide is mainly intended for helicopter pilots, much of the advice will be **equally relevant to gyroplane pilots**.

b) A review of 42 fatal accidents during a recent 15-year period to helicopters of less than 5,700 kg reveals that most should not have happened. Broadly, they are the result of the following:

- low flying including wire strikes	8
- controlled flight into terrain	8
- loss of control VMC	6
- technical failures	5
- third party into rotors	4
- loss of control IMC/night	4
- collision with ground objects	4
- mid-air collision	1
- unknown	2

c) Comprehensive **knowledge**, careful **preparation** and frequent flying **practice** are the best insurance against becoming an accident statistic. Avoid a complacent 'it will be all right' attitude.

2 KNOWLEDGE

2.1 Reporting

a) Learn from the mistakes of others; you might not live long enough to make **all** of them yourself. Improve your knowledge via other peoples' problems by reading the CAA's [GASIL](#), the Air Accidents Investigation Branch's monthly Bulletin and the General Aviation Safety Council's quarterly Flight Safety Bulletin.

b) Share your knowledge and experience with others, preferably by reporting to the CAA's Safety Investigation & Data Department, the British Helicopter Association, the Helicopter Club of Great Britain, or for gyroplanes the Popular Flying Association, anything from which you think others could learn. Your report could prevent someone else's accident. Photographs often help to illustrate a problem.

c) Details of all helicopter occurrences are on the CAA's Safety Investigation & Data Department database.

d) If there is a Manufacturer's Safety Course, improve your knowledge by participating – it could also result in cheaper insurance!

2.2 Refresher Training

Revise your basic knowledge and flying skills by having a **regular** check flight (at least every six months) with an instructor which should include:

- **practice engine failure so that in a single-engine helicopter it is a reflex response to lower the collective IMMEDIATELY and to enter autorotation;**
- in multi-engined helicopters, practice simulated engine-out procedures;
- sloping ground take-offs and landings;
- appropriate emergency procedures for the type of helicopter, including emergency R/T call, either on the intercom or by a practice PAN call;

- AWARENESS of (but not necessarily demonstrated) height-velocity curve, dynamic roll-over, vortex ring, ground resonance and engine icing situations;
- awareness of the importance of maintaining rotor rpm, and proficiency at recognising and recovering from low rotor rpm conditions, both with power ON and with power OFF;
- operation from confined areas;
- assessment of flight visibility; and
- other flying that you or your instructor feel would be beneficial.

2.3 Limitations

a) You must know the helicopter's limitations and your own – **HEED THEM BOTH.**

b) Experienced fixed-wing pilots, but with low rotorcraft hours, may be confident and relaxed in the air but will not yet have developed the reflex responses, control feel, co-ordination and sensitivity necessary in a helicopter. They may well react incorrectly to a low rotor rpm warning. (See paragraphs 2.2 and 4.9(b).) A more cautious approach is necessary.

3 PREPARATION

3.1 Paperwork

Make sure that your licence/rating, certificate of experience and medical are up-to-date. Also check that the helicopter's documents, including Certificate of Airworthiness/Permit to Fly, Airworthiness Renewal Certificates, Maintenance Releases and Insurance, are valid.

3.2 The Helicopter

a) If you do not fly very often, prior to flight study the Pilot's Operating Handbook/Flight Manual etc. so that you are thoroughly familiar with:

- limitations;
- normal and emergency procedures;
- rotor speeds/power settings;
- the height-velocity avoid areas;
- weight and balance calculations; and
- operation of radio and navigation instruments.

b) Sit in the helicopter and re-familiarise yourself with the external and ground checks, cockpit layout, fuel system and position of all controls etc.

c) Carry out refresher training as described in paragraph 2.2 if you have not flown the **type** in the last six months. (Many commercial operators require a check-flight if their pilots have not flown the type in the last 28 days!)

3.3 Weather

a) Get an aviation weather forecast valid for the time of flight, **heed what it says**, and make a carefully reasoned GO/NO GO decision. Do not let 'Get-there/home-itis' influence your judgement. Establish clearly in your mind the current en-route conditions, the forecast and the 'escape route' back to good weather. Take account of the freezing level. Plan a more suitable route if you are likely to fly over high ground which may be cloud-covered.

b) The various methods of obtaining and updating aviation weather information (including codes) are described in the booklet 'GET MET', available free from the Met Office.

c) Know the conditions that lead to the formation of piston engine icing (*SafetySense Leaflet 14*, available free for download from the CAA's website www.caa.co.uk/safetysense). Know the Flight Manual/Pilot's Operating Handbook instructions regarding the use of Carb heat or Engine anti-ice and comply with them. Include Carb Air Temp and OAT in your regular scan of engine instruments.

d) Beware of turbulent and windy conditions, especially if your experience is limited.

e) In wet weather beware of misting of windshield and windows, especially when carrying wet passengers.

3.4 Winter Flying

a) In addition to much of the information in *SafetySense Leaflet 3 'Winter Flying'*, helicopter pilots should also beware of 'white-out', due to blowing snow, when landing on a snow-covered surface.

b) It should also be noted that there are **NO** general aviation helicopters cleared for flight in icing conditions. You must use weather forecasts to avoid snow and icing conditions.

c) Wear warm clothing in case of heater failure or a forced/precautionary landing – you can't put them on in flight!

d) A Canadian gyroplane accident was the result of the pilot's eyeballs freezing. He lost control and crashed.

e) If operating from an icy surface, take care to open and close the throttle slowly and lead with the appropriate yaw pedal to avoid the possibility of the helicopter rotating on the spot.

3.5 VFR Navigation

a) Use appropriate current aeronautical charts, **ready folded to show the planned track**. It may be too late when you are airborne.

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 an air display, or ATC frequency change. (Internet site www.ais.org.uk.)

c) Information on Red Arrows displays and Emergency Restrictions of Flying is available on the AIS website and Freephone **0500 354 802** (or 0208 750 3939), updated daily.

d) Prepare your Route Plan thoroughly with particular reference to Safety Altitude, icing hazards and suitable diversions. Familiarise yourself with geographical features, time points, airspace en-route and the procedures in any helicopter special routes.

e) If you fly a single-engined helicopter and your proposed route takes you over a congested area, forest, lake etc. where a forced landing due to engine failure or unexpected bad weather could be hazardous to yourself or those on the ground, plan a different route where a forced landing would be safe.

f) Note congested areas, high ground, masts and other obstructions in planning your safe altitude; note Maximum Elevation Figures (MEF) on charts. You must not fly over certain High-Security Prisons and other sites in a helicopter. These may not be all shown on your chart, but are listed in the UK [AIP ENR 5-1-2](#).

g) Plan to reach your destination at least one hour before sunset, unless qualified, equipped and prepared for night flying. (Public Transport night flying is prohibited in single-engined helicopters.) You may not spot fog or low cloud at night.

h) To comply with Rule 5 'Low Flying' of the Rules of the Air 2007, contained in [CAP 393](#), you **must NOT fly**:

- within 500 ft of persons, vessels, vehicles and structures, unless taking off or landing in accordance with normal aviation practice;
- within 1,000 m of any assembly in the open air of more than 1,000 persons at an organised event without complying with the procedures in Rule 5(3)(f) of the Rules of the Air 2007. The procedures to be followed at a temporary HLS which is not an aerodrome are contained in the UK AIP, [GEN 1.6](#) paragraph 1.3;
- over the congested area of a city, town, or settlement, below 1,000 ft above the highest fixed object within 600 m of the helicopter, unless flying on a notified route under 'Special VFR';
- at a height/speed combination that would endanger persons or property on the surface in the event of an engine failure; or
- in the London 'Specified Area', except on the notified routes. Landing off the routes other than at a licensed or Government aerodrome/HLS is not normally allowed, but Permission may be requested in specific cases from

the CAA's Flight Operations Inspectorate (General Aviation) (FOI(GA)) using Form SRG [1304](#), available from www.caa.co.uk.

Note: If your proposed flight appears to be limited by Rule 5, first check the full terms of the Rules and, if necessary, seek further advice from FOI(GA).

i) If you intend to fly below 1,000 ft agl (where most military low flying takes place), use Freephone **0800 515544** for the Civil Aircraft Notification Procedure (CANP) or Pipeline and Power line Inspection Procedures (PINS) to let them know where and when you will be operating on relevant activities (see appropriate AICs [Y 075/2010](#) and [Y 073/2010](#) and *SafetySense Leaflet 18 'Military Low Flying'*).

j) Know the procedure if you get lost (see paragraph 4.8) and always be mentally prepared to land if things get difficult.

k) Above all, prepare a thorough route plan (*SafetySense Leaflet 5 'VFR Navigation'*). Make sure you have sufficient fuel for the flight and possible diversion, and where you can top up en-route if necessary.

l) GPS is a very useful back-up to other methods of navigation, but NOT a substitute for them. Double check way-point calculation and entry, then load and activate the route before take-off if you have the facility. See *SafetySense Leaflet 25 'Use of GPS'*.

m) Much useful guidance is available from the BHA website: www.britishhelicopterassociation.org.

3.6 Radio

a) Know what to do if the radio fails, including when flying Special VFR in controlled airspace etc.

b) Have all necessary radio frequencies to hand, including those for destination and diversion aerodromes, VOLMET, LARS, Danger Area Crossing Service etc.

c) If using radio nav aids to back up your visual navigation, note their frequencies and Morseidents.

d) Brush up periodically on radio procedures, phraseology etc. ([CAP 413 'Radiotelephony Manual'](#)).

3.7 Weight and Balance

a) Use the actual (not typical) empty weight and centre of gravity (cg) from the latest Weight and Balance Schedule of the **actual** helicopter you are operating. Helicopters get heavier due to extra equipment etc. Take account of ground handling equipment, camera installations, etc.

b) Check that the helicopter's maximum/minimum weights are complied with. If too heavy, you must adjust the weight by off-loading passengers, baggage or fuel.

c) Check that the cg is within limits for take-off and throughout the flight; for example after passengers leave, or with low fuel and two heavy crew in front. In some helicopters, you may run out of cyclic control for landing. You may have to carry ballast; it must be suitable and properly secured.

d) **Never** attempt to fly a helicopter which is outside the permitted weight/cg range and performance limitations. It is dangerous as well as illegal, and invalidates the C of A and almost certainly your insurance.

3.8 Performance

a) Make sure that the sites you intend using are large enough for take-off and landing. Use the Pilot's Operating Handbook/Flight Manual to calculate the space and power required. Calculate your density altitude.

b) Use the recommended take-off and landing profiles. **Minimise** flight in the height-velocity avoid areas.

3.9 Fuel Planning

a) Always plan to land by the time the tanks are down to the greater of 1/4 tank or 45 minutes, but don't rely solely on the gauge(s) or low fuel warning. Remember, a headwind may be stronger than forecast, which particularly affects slower-flying helicopters. Frequent use of carb heat/hot air will also increase fuel consumption.

b) Know the hourly fuel consumption of your helicopter. In flight, check that the gauges agree with your calculations.

c) Understand the operation and limitations of the fuel system, gauges, pumps, mixture control (do not lean mixture unless it is permitted), unusable fuel etc.

3.10 Destination

a) Check for any special procedures due to activities at your destination, such as parachuting, gliding, microlighting etc. Use the UK Aeronautical Information Publication (UK AIP, available through the AIS website www.ais.org.uk) or other Flight Guides to find out where the helicopter operating area is located. Check NOTAMs and Temporary Navigation Warnings, etc.

b) If your destination is a private landing site, the surroundings may be very different from the licensed aerodrome at which you learnt to fly, or from which you normally operate. The final approach and take-off area should be at least twice the length of the helicopter including rotor blades. There may be hard-to-see cables or other obstructions in the approach path, or hills, trees and buildings close to the site giving wind shear and/or unusual wind patterns. Read the guidelines published by the British Helicopter Association (BHA) on their [website](#).

c) Try to choose a landing site where you can use the recommended profiles, but if that is impossible consider:

- a check out with an instructor or someone who knows the site well; or
- a check from the ground of the potential problems associated with different wind directions, or the reduced climb on a hot day.

Always minimise the time that the helicopter is at greatest risk from engine failure.

d) In an emergency, a helicopter pilot is in the fortunate situation of being able to land almost anywhere. While you always need to be prepared to do that, under normal circumstances you need the landowner's (or his Agent's) permission, which is a requirement for any take-off. This also applies at strips and most aerodromes, where Prior Permission is Required (PPR).

3.11 Flying Abroad

a) Make sure you are conversant with the aeronautical rules, charts (including scale and units, e.g. feet or metres), airspace etc. for each country you are flying to/over.

b) Take the helicopter's documents which include your licence and a copy of 'Interception Procedures' (*SafetySense Leaflet 11*). Some countries (e.g. Spain) require your insurance details written in their language.

c) Before crossing an International FIR boundary you must file a Flight Plan, check that it has been accepted and activated (*SafetySense Leaflet 20 'VFR Flight Plans'*).

d) The Terrorism Act includes restrictions for flights to Ireland, Channel Isles and Isle of Man. (UK AIP GEN 1.2, paragraph 1.5.)

e) **Permit to Fly aircraft may need special permission in many countries.**

3.12 Over Water

a) Before flying over water, read *SafetySense Leaflet No. 21 'Ditching'*. Some helicopter manuals/handbooks contain specific advice on ditching including the need to apply full lateral cyclic control as the helicopter contacts the water to stop the main rotor blades.

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

c) When flying over water, everyone in a single-engined helicopter should, as a minimum, **wear** the lifejacket which is legally required to be carried. In the event of an emergency there will be neither time nor space to put one on.

d) The water around the UK coast is cold even in summer and survival time may be only 15 minutes (about the time to scramble an SAR helicopter). A good quality insulated immersion suit, with warm clothing underneath and the hood up and well sealed, should provide over three hours' survival time. In water, the body loses heat 100 times faster than in cold air.

e) 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 the rescuers find you. It should be properly secure, but easily accessible as a helicopter will sink faster than an aeroplane.

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

g) Carry an approved ELT, and/or a Personal Locator Beacon (PLB) transmitting on 406 MHz, and flares.

h) Remain on an appropriate aeronautical radio station frequency.

i) Pilots and passengers who regularly fly over water are advised to attend an underwater escape training and Sea Survival Course (details in 'Ditching' leaflet).

j) If the helicopter has flotation equipment, make sure you are familiar with its operation.

k) Minimise over-water time in single-engined helicopters.

3.13 Night Flying

Night flying is a combination of visual and instrument flight, the ratio depending on the weather and background lighting including moonlight. You must have a Night Rating and you should be in current instrument flying practice (e.g. during the previous 28 days). For night take-offs and landings, the site and any relevant obstacles should be illuminated by external means.

3.14 Pilot Fitness

a) Don't fly when ill or tired – it is better to cancel a flight than to wreck a helicopter or hurt yourself!

Are you fit to fly – 'I'm Safe' checklist:

- 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 (to keep correct blood-sugar level).
- b) If you have to wear glasses for flying, make sure that the required spare pair is readily accessible. Sunglasses and a peaked cap may be useful.
- c) During hot weather, beware of dehydration. Have water available; the cabin can act like a greenhouse.
- d) Wear clothes that cover the limbs and give some protection in the event of fire. Avoid synthetic material which melts into the skin.

4 **PRACTICE**

4.1 Pre-Flight

a) After removing blade tie-downs, pitot and engine covers, complete a thorough pre-flight inspection, paying particular attention that swashplate, control rods etc. are secure and in good condition – climbing may be necessary. Don't forget any 'telatemp's designed to show overheating. **Use the check list.**

b) Check the surrounding area for loose objects that could blow about in the rotor wash and that the rotor disc will be well clear of obstacles.

c) Determine visually that you have enough fuel of the right type, with any necessary additives. Don't let anyone confuse AVGAS and AVTUR (JET A1). **Personally supervise re-fuelling** and be aware of the danger of static electricity. If necessary, use a dip-stick to check fuel levels. Make sure the filler caps are properly secured and the earthing cable disconnected. With the fuel selector ON, check fuel drains for water and other contamination. Minimise 'Rotors Running' refuelling, which should only be done if approved in the Flight Manual.

d) **Check engine and transmission oil levels** and, if necessary, top them up. Don't be fooled by a 'tide line' on the sight glass, this has led to failures as there was no oil in the gear box.

e) Check engine intake(s) for foreign objects, particularly on turbine helicopters.

f) Remove all ice, snow and **FROST** from the helicopter. Even light frost can disturb the air flow over an aerofoil surface. (Beware of re-freezing.) Only use authorised

de-icing fluids on rotor blades, due to the possibility of damaging the bonding of metal fittings and composite rotors.

g) If you find anything which you are not happy about, get further advice.

h) When doing the internal checks, **use the check list**. Confirm **visually** that the rotor blades move correctly in response to control inputs.

i) Properly secure any baggage so that nothing can foul the controls. Beware of loose items, e.g. cameras being carried by passengers.

j) Make sure all baggage doors are properly closed and locked.

4.2 Passengers

a) Removal or blanking of dual controls will prevent passenger interference.

b) The law requires that you **MUST** brief passengers on the location and use of doors, emergency exits and safety harnesses as well as emergency procedures. Personally check that doors and hatches are secure (*SafetySense Leaflet 2 'Care of Passengers'*).

c) Centralise the controls and switch on the beacon/strobe. Do not start the engine until all ground personnel are well clear of the helicopter and all passengers are seated inside with the doors secure.

d) Do not let passengers step up into the helicopter and then wave to their friend, their hands may be much too close to the rotor disc.

e) If it is necessary for passengers to get in or out with the rotors turning, brief someone to escort passengers to and from the helicopter. Passengers may behave oddly and

do silly things in the wind and noise of a running helicopter; children's hands should be firmly held. Always approach from the front, wait outside the rotor disc until the pilot has given a 'thumbs up'. **NEVER** walk uphill away from a helicopter or downhill towards a helicopter - the rotor tip may do more than part your hair!

f) Some passengers may be affected by flicker vertigo, see [AIC 75/2001](#) (Pink 23) 'The Effect of Flickering Light on Passengers and Crew'.

4.3 Starting Engines

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

b) **Use the check-list** and closely monitor the appropriate gauge(s).

c) If parked on snow or ice, don't forget the possibility of the helicopter yawing. Open and close the throttle carefully.

4.4 Take-off

a) Know the helicopter Marshalling Signals, contained in [CAP 637](#) 'Visual Aids Handbook'.

b) Make sure you know the maximum demonstrated sideways speed for the helicopter type you are flying and factor this for your experience and recency.

c) Ensure skids are not stuck to the ground by mud or ice. This has caused helicopters to roll over on take-off.

d) Take particular care if you have to lift off cross-wind or down-wind, there may only be marginal control if there is a crosswind of 10–12 kt from

the critical side. This can also affect hover taxiing.

e) Beware of hovering close to tall buildings and hangars when there is a possibility that the helicopter downwash will not dissipate uniformly and may re-circulate through the top of the rotor disc. This will require more power to hold hover height and produces a dynamic force towards the obstruction. As a rule of thumb, re-circulation can occur when the helicopter is hovering closer than two thirds of the rotor diameter from an obstruction.

f) Before lifting off, always carry out a clearing turn. Consider your options such that engine failure will not be a hazard to persons or property on the ground (see paragraph 4.11 on rotor wash).

g) Lift off slowly into a low hover and check engine gauges including manifold pressure/rpm and control effectiveness.

h) If you take off into a strong wind and then turn down-wind with constant pitch and attitude, the speed 'perceived' from ground reference will appear to increase by an amount equivalent to the wind speed. If you then attempt to reduce 'perceived' speed by increasing the attitude, it can lead to the use of high power, together with a reduced rate of climb and in severe cases a high sink rate. You are now in the classic vortex ring condition, near the trees with low IAS and full power. Now get out of that! (See paragraph 4.13(c).)

4.5 Look Out

a) Always keep a good look-out (and listen-out) for other aircraft, particularly over and close to radio

beacons, Visual Reference Points and in the vicinity of aerodromes. 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 more likely to hit. Beware of blind spots and move your head, or the helicopter, to uncover these areas. Scan effectively. (*SafetySense Leaflet [13](#) 'Collision Avoidance'.*)

b) Helicopters are harder to see than aeroplanes so if the fixed-wing pilot hasn't seen you, you had better keep an exemplary look out and make sure you've seen him!

c) Remember the Rules of the Air which include flying on the right-hand side of line features (even if your helicopter is flown from the right) and give way to traffic on your right.

d) If the helicopter has strobe lights, use them in the air. If you are in a crowded circuit environment, use landing lights as well.

e) Keep your transponder switched to ALT at all times when airborne, with the appropriate conspicuity code (7000), unless instructed otherwise.

f) Spend as little time as possible with your head 'in the office'.

4.6 Airspace

a) Do not enter controlled airspace unless **properly authorised**. You might have to orbit until cleared. Keep out of Danger and other Restricted or Prohibited Areas, although you may be able to transit using a Danger Area Crossing Service.

b) Use the Lower Airspace Radar Service (LARS), which is available

from many RAF and civil aerodromes, particularly on weekdays. It may prevent you from getting a nasty fright from military or other aircraft.

c) A LARS or other radar-equipped unit may be able to provide assistance in seeing and possibly avoiding conflicting aircraft. In certain cases they may also be able to help you avoid other hazards such as controlled airspace. In any case, a Controller or Flight Information Service Officer can provide you with useful information, for example altimeter settings or weather reports (see *SafetySense Leaflet 8 'Air Traffic Services Outside Controlled Airspace'*). Make sure you know which service you are receiving, but remember 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. However, as said before, ensure your transponder is always switched on, with Mode C (ALT) selected if fitted.

e) If uncertain of your position near controlled airspace in the UK, call the controlling unit if you can, or go direct to 121.5 MHz and ask for assistance from the Distress and Diversion Cell.

4.7 En-route Diversion

a) You must not lose sight of the surface unless appropriately qualified, in current practice, and flying a suitably equipped helicopter. Don't fly above clouds unless they are widely scattered and you can remain in sight of the surface.

b) If you encounter deteriorating weather **turn back, divert or land before you are caught in cloud**. A 180° turn in cloud can easily become a death spiral!

c) Maintain a safe cruising altitude. 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'.

d) Unless you have an instrument rating, you may not continue in a flight visibility of less than 1,500 metres, and are strongly advised not to continue if flight visibility is below 3,000 metres. In conditions of low visibility or lowering cloud, turn back, divert or make a precautionary landing while you have enough visual cues to control the helicopter. **Don't PRESS ON – LAND ON!**

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

f) Divert if the periodic cruise check, such as FREDAW (fuel, radio, engine, DI, altimeter, weather) indicates you won't have 45 minutes' fuel reserve at destination.

4.8 Lost

a) If you are lost (or temporarily 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 make your PAN or MAYDAY call. If you have a transponder, the emergency code is 7700; it will instantly alert a radar controller. Select Mode C, if fitted.

b) If you are lost and any of the items below apply to you, call for assistance – ‘**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** - PAN call in good time – don’t leave it too late.
- M** - Met conditions – is the weather deteriorating?
- E** - Endurance – fuel remaining; is it getting low?

c) As a last resort, **make an early decision to land** while you have fuel and daylight to do so. Choose a site with care and afterwards telephone to advise that you are safe and obtain a weather update or further help.

4.9 Control Considerations

a) Fly at a safe speed in relation to visibility. Minimise time in the ‘height-velocity avoid curve’. Above all, **maintain rotor speed**; needles should be at the top of the green band rather than the bottom.

b) In most helicopters, particularly two-bladed teetering rotor types and especially gyroplanes, you **MUST** avoid any push-over manoeuvre resulting in negative ‘g’. This can be one of the causes for the main rotor striking the tail boom with catastrophic results.

c) When manoeuvring at high speed, or in turbulence, it is possible for some helicopters to experience undemanded pitch up and roll inputs, and even apparent control restrictions. Recover by reducing speed and pitch (AIC Pink [043/2009](#)).

4.10 Environmental

a) The public don’t like helicopter noise. Several aerodromes and landing sites are under threat of closure due to this, so it is vital to be a good neighbour. Read the ‘Code of conduct’ on the BHA website www.britishhelicopterassociation.org. Know the noise pattern for your helicopter; most comes from the tail rotor. Often a turn of 90° can direct the noise away from a neighbour. Avoid ‘blade slap’ on descent by slowing down early with no sudden manoeuvres.

b) Adhere to noise abatement procedures and do NOT fly over noise-sensitive or other sensitive areas. These are detailed in the UK AIP or other Flight Guides or may be established on a local basis.

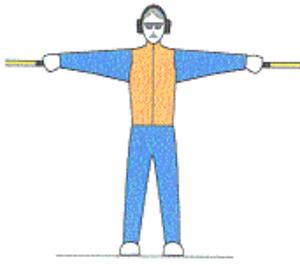


c) When en-route, fly at a height/power setting which will minimise noise nuisance, as well as complying with Rule 5, ‘Low Flying’ (see paragraph 3.5(h)).

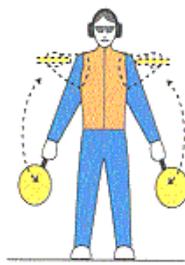
NEVER be tempted to ‘beat up’ the countryside.

d) Select sites for practice auto rotations very carefully – HASELL includes ‘LOCATION’.

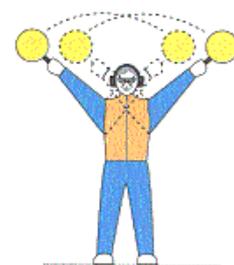
SOME HELICOPTER MARSHALLING SIGNALS



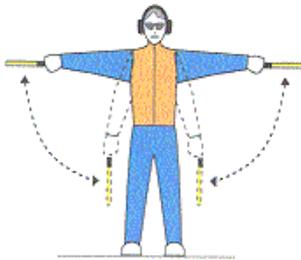
Hover: Arms horizontally sideways, palms downward.



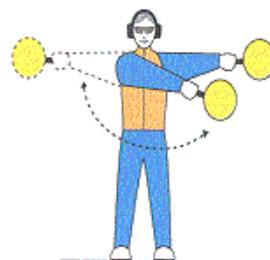
Move Backwards: Arms by sides, palms facing forward, arms swept forward and upward repeatedly to shoulder height.



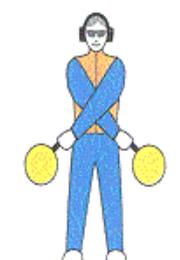
Stop: Arms repeatedly crossed above the head.



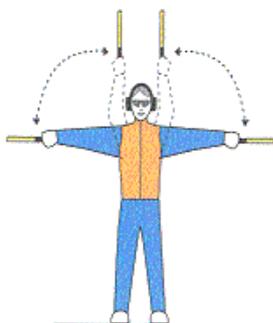
Move Downward: Arms extended horizontally sideways, with palms turned down, beckoning downwards.



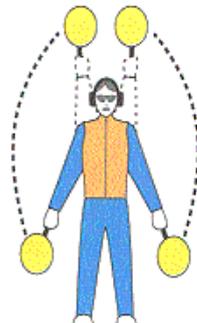
Move Sideways: Either arm placed horizontally sideways, then the other arm moved in front of the body to that side, in the direction of the required movement; repeated several times.



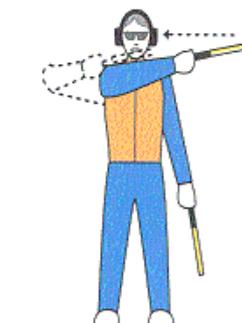
Land: Arms placed down and crossed in front of the body.



Move Upward: Arms extended horizontally sideways, with palms up, beckoning upward.



Move Ahead: Arms repeatedly moved upward and backward beckoning onward.



Cut Engine(s): Either arm and hand placed level with the chest, then moved laterally with the palm downwards.

Note: In many cases the speed of arm movement indicates the rate/urgency.

4.11 Wake Turbulence and Rotor Wash

a) Don't operate in conditions worse than those stated in the Pilot's Operating Handbook/Flight Manual. Remember, these were obtained by a test pilot! If in doubt – re-plan.

b) Stay well clear of the 'blast' end of powerful aircraft.

c) Always be mindful of the effect your own rotor wash can have on others. It may cause problems for lighter aircraft in flight, or damage to parked aeroplanes and other surface objects. If hovering, your rotor turbulence can affect others out to a distance of three times your rotor diameter. Objects may even be re-circulated into your own airflow.

d) 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 large aircraft. (SafetySense Leaflet [15](#) 'Wake Vortex' provides further guidance.) Hover-taxiing helicopters generate very powerful vortices. If your wash might affect others, land!

e) Note that wake turbulence lingers **when wind conditions are very light**. These very powerful vortices are invisible. Heed Air Traffic warnings and consider others.

4.12 Circuit Procedures

a) When joining or re-joining make your radio call early and keep radio transmissions to the point – 'cut the chat'. If non-radio (or your radio has failed), know the procedures.

b) Check that the change from QNH to QFE reduces the altimeter reading by the landing site elevation. If landing using QNH, don't forget to add the site elevation to your planned circuit height.

c) Use the appropriate joining procedures at your destination aerodrome. Check circuit height and look out for other aviation activity, e.g. gliding, parachuting.

d) Check the windsock or nearby smoke to ensure you land into wind. Be very sure of the wind direction and strength before committing yourself to an approach direction.

e) Make radio calls in the circuit at the proper places and listen and look for other traffic. Remember pre-landing checks – easily forgotten if you make a straight-in approach.

f) If you have to fly a fixed-wing circuit, maintain your speed, do not slow down or hover thus creating a collision hazard from following traffic.

g) Be aware of optical illusions at unfamiliar landing sites, e.g. those with sloping terrain.

h) Take care at aerodromes where identification of the runways can be confused, e.g. 02 and 20. Make sure you know whether the circuit is left-hand or right-hand, as this will determine the dead side. If in doubt – **ASK**.

i) In most piston-engined helicopters, apply carb heat well **BEFORE** reducing power. You may decide to return to cold at 200 ft plus above ground.

j) Reduce rate of descent before reducing airspeed.

4.13 Landing

a) Don't land in tall dry grass - the hot exhaust could start a fire.

b) A good landing is a result of a good approach. If your approach is bad, make an early decision and go around.

c) Avoid conditions likely to result in Vortex Ring:

- Power On.
- Low IAS (below 35 kt).
- High rate of descent (over 300 ft per minute).

See [AIC P 020/2010](#) 'Vortex Ring'.

d) The unplanned down-wind approach is particularly hazardous. It can lead to over-pitching, and loss of rotor rpm and lift, resulting in a hard contact with the ground. (Correlators are less effective at high power settings, so maintain rotor rpm by leading with the throttle before applying pitch.)

e) If there is a white H marking, you must use that area.

f) Do not hover or hover-taxi close to landing aeroplanes. If you have to hold position close to a runway, land.

g) If you are loading passengers, have them escorted to/from the helicopter, or else make them wait until the rotors have stopped. They **must** be made aware of the dangers from the main and tail rotor (see paragraph 4.2(e)).

h) Remember, the flight isn't over until the engines are shut down, all checks have been completed and the rotors have stopped.

i) 'Book in' and close any Flight Plan; if necessary phone the local Air Traffic Service Unit. See SafetySense Leaflet [20](#) 'VFR Flight Plans'.

USEFUL ADDRESSES

- Flight Operations Inspectorate (GA),
Aviation House,
Gatwick Airport,
West Sussex RH6 0YR.
Tel: 01293 573525
Fax: 01293 573973
- GA Safety Promotion (FOI[GA])
Tel: 01293 573225
- Safety Investigation & Data Dept (Aviation House address above)
Tel: 01293 573220/1
Fax: 01293 573972
- Air Accidents Investigation Branch, Berkshire Copse Road, Aldershot, Hants GU11 2HH
Tel: 01252 512299
Fax: 01252 376999
- British Helicopter Association
Graham Suite,
West Entrance,
Fairoaks Airport,
Chobham,
Woking GU24 8HX
Tel: 01276 856100
Fax: 01276 856126
www.britishhelicopterassociation.org

A helicopter has the unique ability to land almost anywhere. If, despite our advice, you find yourself in a weather, fuel, navigation or other difficulty – simply LAND and sort out the situation.

5 MAIN POINTS

- If the engine fails in a single-engined helicopter, you must have a reflex response to lower the collective **IMMEDIATELY**.
- Keep current. Regular simulated engine-off landing practice with an instructor is recommended.
- Know the helicopter thoroughly.
- Always get an aviation weather forecast, and update it through the day.
- Prepare a thorough Route Plan using latest charts and check on NOTAMs, Temporary Nav warnings etc.
- Keep time over water to a minimum in a single-engined helicopter and wear a lifejacket (and a survival suit), and carry a life-raft.
- Pre-flight thoroughly with special emphasis on fuel, engine and transmission oil contents, and flying controls.
- Brief passengers/ground staff about getting in and out of helicopters. Either have passengers escorted or shut down the engine(s).
- Don't over-load the helicopter.
- In a single-engined helicopter, bear in mind the possibility and consequences of engine failure.
- Minimise time in the 'avoid curve'.
- Maintain a good look-out, scan effectively.
- Make regular cruise checks of OAT or carb air temperature, and when necessary use carb heat.
- Keep out of controlled airspace unless you have clearance.
- Request help early (or land) if lost or have other problems, e.g. fuel shortage.
- Return or **land** early if the weather deteriorates. Maintain a safe altitude.
- **Maintain rotor rpm.**
- Avoid retreating blade stall in turbulent conditions or near V_{NE} – **SLOW DOWN**.
- Push-over negative 'g' manoeuvres can be catastrophic, particularly in gyroplanes.
- Consider the effects of your rotor wash on others.
- Remain at the controls until the rotors have stopped turning.
- Don't do anything stupid – become an old pilot, NOT a bold pilot.