GASIL

General Aviation Safety Information Leaflet

Civil Aviation Authority

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Helicopter hot and high

The BEA (French AAIB) recently published an accident report concerning an R44. It seems the pilot was attempting to land in a mountainous area, but his planned landing site was considered unsuitable and he decided to change to one a short distance away. While approaching that site at a height of a few feet and at very low speed, the rotor was unable to provide sufficient power to maintain the approach path. The helicopter's skid contacted the ground, causing it to turn and contact the ground heavily before catching fire.

File photo

Taking into account the site elevation and the temperature, the investigation suggests that while the aircraft was in ground effect there was more than adequate power available to stay airborne at the low airspeed. However, once some of that ground effect was lost, possibly due to the sloping terrain, or to a gusting wind, the power available was insufficient to maintain level flight.

Conditions in mountainous or even hilly terrain can change rapidly. To operate safely in such terrain requires considerable knowledge, not only of orographic meteorology but also of our aircraft's performance. We must also be conscious of the human factors which may lead us to either forget or disregard that fact.

Cover up

We have in the past described incidents of aircraft losing airspeed indications as a result of blocked pitot tubes. A pitot cover (provided it is removed before flight – but that's another problem) can provide protection against insects nesting inside, and we have also suggested in the past that pilots might consider placing a plug in the static vent to provide similar protection for the static system.

Recently we were reminded that infestation can present problems in other systems. Several Piper Arrows (and probably some similar aircraft) have automatic 'back-up gear extension' systems which automatically lower the undercarriage below a certain airspeed which in the case of the Arrow is detected in a separate pitot/static system on the side of the cockpit. The gear cannot then be raised again until airspeed is increased above another value.

The system is not normally exercised in flight, but it seems that recently an instructor was demonstrating the facility during differences training. Once the system had lowered the undercarriage, it proved impossible to raise it again, despite increasing indicated airspeed. We suspect the pilot decided not to attempt to use the over-ride facility, but preferred to leave the undercarriage in a safe condition.

The culprit was identified as what appear to be insect larvae, and the incident serves as a reminder that a blockage in the main pitot static system, especially if flight cannot be completed by visual reference, can cause serious problems.

Emergency ADs

EASA produces bi-weekly summaries of the ADs they have issued or approved, which are available through their website www.easa.eu. Foreign-issued (non-EU) Airworthiness Directives are also available through the same site, as are details of all recent EASA approved Airworthiness Directives. CAA ADs for UK manufactured aircraft which have not yet been incorporated in CAP 747 can be found on the CAA website http://www.caa.co.uk/ads.

We are aware that the following Emergency Airworthiness Directives have been issued recently by EASA; however, this list is not exhaustive and must not be relied on.

Number	Applicability	Description
EASA 2012-0213-E	AW139	Collective & cyclic control system
EASA 2012-0217-E	Eurocopter AS350 B3	Tail rotor laminated half-bearings
EASA 2012-0228-E	Aermacchi F260, S208	Propeller governor idler gear shaft

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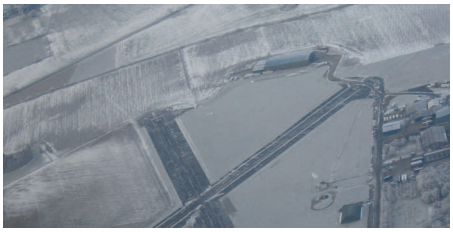
Winter draw(er)s on!



Perhaps a little later than usual, we ought to draw pilots' attention to the hazards of operating in cold and possibly freezing weather which are the hallmarks of a UK winter. SafetySense leaflet 3, available like all such leaflets free for download from the CAA's website www.caa.co.uk/safetysense contains a considerable amount of extremely useful advice, which we do not propose to repeat here. If you intend flying at any time during the next few months we strongly suggest that you download the leaflet, study it, and follow its advice. In addition, please recommend others you may come into contact with to do the same.

Wind

An accident report in the AAIB's Bulletin 9 of 2012 concerns an X'Air microlight whose pilot apparently lost control in turbulence while attempting to land in a crosswind. In this case, it seems the pilot had elected to land on what had been a possible fuel diversion field because he had become concerned that the weather was worsening. According to the report, having gone around from two previous attempts to land, at about 30 feet on the third attempt, the pilot was unable to counter a roll to the right. The aircraft crashed into the foundations of a house, causing him serious injuries.

The report notes that the forecast indicated post-cold front conditions, with occasional showers of rain, hail and snow. The forecast indicated 40 knots of wind at 2,000 feet altitude and 30-35 knots at 1,000 feet. We remind pilots that the convective activity suggested by any forecast of showers can be expected to cause considerable mixing of air, and consequently gusts at the surface of up to the strength of the gradient (2,000 foot) wind. We suggest that flying a microlight in 30 knots or more of wind is inadvisable.

Human factors textbooks note that there are many possible reasons why a pilot may feel pressure to carry out a flight. Such pressure would encourage a pilot to find evidence that conditions were actually better than forecast. We have warned in the past about accepting verbal reports of weather at one's destination, so any such reports must be treated with extreme caution, especially if the person giving it may also be feeling pressure for the flight to take place.

Wet grass

SafetySense leaflet 7, "Aeroplane performance", available like all such leaflets free for download from www.caa.co.uk/safetysense, draws attention to the reduction in acceleration on take-off, and also to the additional ground run required to stop after landing if the surface of the runway is short wet grass. Many pilots have discovered that the increase of up to 60% quoted is no exaggeration. If longer grass is wet, there is also the potential for the propeller to spray water onto the wings during the taxi and take-off phases. Certain aircraft types are known to suffer a notable loss of performance with wet wings.

However, as the pilot of a Musketeer apparently found recently, the hazards of wet grass are not restricted to the decrease in take-off and landing performance. It seems that having gathered speed during a downhill taxi, when the pilot attempted to slow down and turn on the wet grass, the aircraft slid sideways into a hedge, causing damage to the wing, fuselage and tail.

It is important to consider the effects on our flight of all the environmental conditions we are likely to experience on a particular day, and make appropriate allowances.

Rotor downwash

The CAA's GA SafetySense leaflet 15 'Wake vortex' is available like all such leaflets free for download from www.caa.co.uk/safetysense. It includes a warning that the vortex from a helicopter can be considerably more powerful than that of an aeroplane of similar size. In a recent accident report, the BEA (French AAIB) have written that the turbulence produced by a helicopter is 8 times that from an aeroplane of similar size.

The report in question concerns an AS350 whose commander elected to fly a shortened circuit pattern in order, as he thought, to land before a light aeroplane which he had observed on the downwind leg. It seems he announced his intention on the radio. However, as the helicopter rolled into the final approach, the pilot of a DR400 which he had not seen announced his presence on 'final'. Apparently, the helicopter commander then applied power to accelerate, continuing towards the runway and thereby overflying the aeroplane. As the rotor downwash struck the aeroplane, it was tipped over forcefully onto its wing, and the pilot was unable to regain control before it contacted the ground, causing considerable damage.

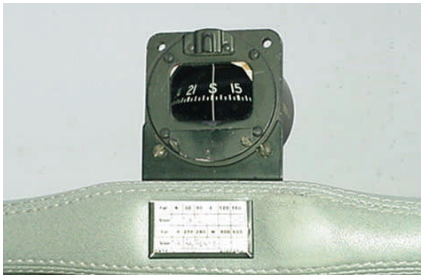
File photo

Most aeroplane pilots know to avoid flying into rotor downwash or wake vortices. Helicopter pilots must constantly remember that their presence can hazard other aviators, and take all steps to minimise that hazard. However, if we enter a traffic pattern without ensuring we are aware of every other aircraft's position in that pattern, it is very difficult to stay far enough away to avoid causing them problems.

Electrical power

The AAIB report on the Archer ditching referred to elsewhere includes some perhaps unexpected findings about light aircraft compasses. The aircraft apparently experienced an electrical power failure, and the report considers the alternator had been producing no output for some time. The investigation considered the consequences for the aircraft compass.

An aircraft's compass deviation would have been corrected, and the deviation card produced, using compass readings taken with the electrical system and equipment operating normally. With the alternator selected off, or not operating, the compass deviation would differ from when the electrical system was operating normally. A flight trial of a similar aircraft determined that with the alternator selected on and off the compass heading would vary by 12° on a southerly heading and 8° on a westerly heading.



We may occasionally forget that electromagnetic fields produced by any device can and will modify the earth's magnetic field as detected by an aircraft compass. Switching off equipment which was selected ON when the compass was swung, or adding another device in the cockpit, is likely to produce changes in the compass deviation. A fix-point navigation technique, such as that recommended by the Royal Institute of Navigation in their leaflets 'VFR route planning' and 'visual navigation techniques for pilots', free for download from their website www.rin.org.uk >SIGS > GANG>resources, should keep a pilot close enough to his planned track to combat most changes in deviation. However, the error produced by a failed alternator, especially if no check features are available, can be expected to cause significant deviations from planned track. We should bear that in mind when considering our actions in the event of electrical failures.

Carbon Monoxide

This article was written several years ago, but is worth repeating here. You've no doubt seen the little Carbon Monoxide (CO) indicators in some aircraft. In fact, we hope you see them every time you fly, because they are the only way you will have of knowing that dangerous fumes have entered your cockpit!

You may find yourself in the same situation as the two pilots who were flying on a navigation exercise some winters ago, with the cabin heating selected. They were actually able to smell fumes, and at the same time the cardboard CO indicator started rapidly turning dark. They turned off the heating and opened the window side panels, and the smell quickly disappeared. They managed to convince themselves that the indicator was not becoming any blacker and flew on, checking each other regularly. Concern about the problem (and no doubt the cold!) persuaded them to cut the trip short.

On landing, a cracked weld was found in the exhaust system. After repair the problem did not recur, and the crew appeared to have suffered no lasting ill effects.

However, we shortly afterwards received a report from a pilot who had had a very narrow escape. He actually suffered all the symptoms of hypoxia, including the characteristic general feeling of well-being, while flying his light aircraft at quite a low altitude. He also noticed that his skin had developed the pink hue which is common in CO poisoning cases. Unfortunately, although he could see that the CO detector in his aircraft had turned dark, he was affected so much that he did not treat his situation as the emergency it was. He was fortunate to make a safe if rather erratic approach and landing back at his base airfield, and subsequently suffered a severe headache. And a PA24 fatal accident in 2001 was attributed to carbon monoxide poisoning.

Carbon Monoxide has no smell itself, and by supplanting oxygen from the haemoglobin in the blood can rapidly cause all the symptoms of hypoxia. These vary from individual to individual, but can generally be regarded as similar to the symptoms of an excess of alcohol in the system, with its attendant euphoria, slurred speech, erratic behaviour and impaired decision making.

It is also difficult to flush CO out of the blood afterwards, so if you have been subjected to Carbon Monoxide poisoning, even without any obvious symptoms, you should seek medical assistance as soon as practicable. It is not a good idea to continue with the flight.

Please note, the cardboard indicators themselves have a limited life. Replace them at the recommended intervals, and at any time after the cockpit environment has been affected by chemicals. Carbon Monoxide is a killer.

GPS

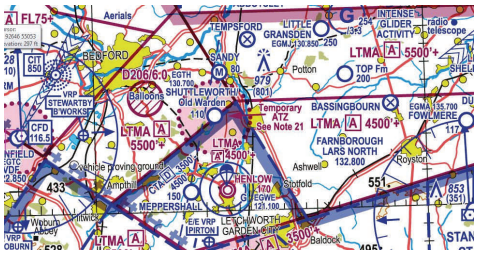
We continue to caution against the use of GPS navigation systems as the primary means of navigation. Although a GPS-derived position is extremely accurate, even systems certified for IFR use are open to human errors. Anyone who fails to cross-check the information displayed against the information they have previously planned using a more traditional means and common sense is placing themselves and their passengers at risk.

The AAIB report into the ditching of a Piper Archer last year, published in Bulletin 10 of 2012, questions why the aircraft was far from its flight planned track when the pilot decided to ditch his aircraft. Although the aircraft seems to have suffered a failure of electrical power, the subsequently radar-derived track did not seem to correspond to the passenger's statement that it seemed to have been following close to the track displayed on the GPS set before the loss of power.

The report suggests that the GPS track guidance displayed may have been based on an erroneous destination being selected in the equipment. This theory is supported by a track deviation made by the pilot on the previous flight which was also considered to be possibly due to an incorrect destination being programmed into the GPS. Human beings are susceptible to slips and lapses. Don't let a seemingly accurate and labour-saving device take you where you don't want to go!

Old Warden

Every summer, displays take place at Shuttleworth Old Warden aerodrome, and for many of these the ATZ at becomes activated by NOTAM. This summer, there were several instances of pilots flying into that ATZ when it was active without obtaining the necessary information about traffic inside it to allow them to fly through it safely.



Whether these pilots failed to download and read the NOTAMs, or just forgot the ATZ was active, flying through an area in which a flying display or practice is taking place is hazardous. While it may seem obvious, and even patronising to say it, display aircraft can be expected to change their track and altitude very rapidly, greatly increasing the likelihood of collision with another aircraft which the display pilot is not expecting. Most collisions occur close to aerodromes, don't add to the number!

Control restriction

A recent report involved a Vans RV8 whose pilot was unable to reduce power for his approach and landing. Power restrictions should be regarded as a possibility at any time, and as with all emergencies, we should consider what our actions should be in such a situation long before we ever are confronted with the reality. The possibility would be a suitable subject for discussion with a flying instructor, perhaps in conjunction with a revalidation flight. In general, however, if sufficient power remains to maintain level flight, we should all be capable of carrying out glide landings from whatever point we shut down the engine, ideally at an aerodrome with a long enough into wind runway to provide a suitable margin for error.

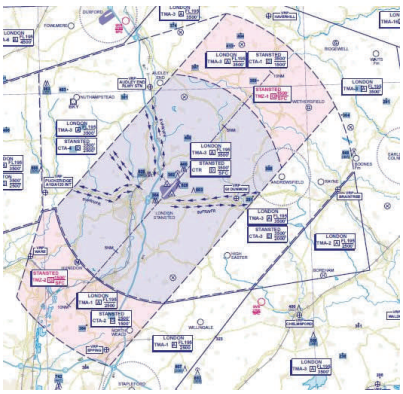
However, in this particular case, the pilot had recently been flying over large expanses of water, and had sensibly positioned a life raft in the rear cockpit where he could access it in the event of a ditching. Having landed at an aerodrome from which no more long sea crossings were anticipated, he then moved the raft, possibly to gain access to items he considered more important.

It seems that during the take-off and climb, the raft moved into a position where it rested against the throttle lever, preventing it from closing. In an honest report, the pilot reflects that he should have secured the life raft properly to prevent any movement. He also considers himself very lucky that the life raft had not moved further and obstructed the rear stick. Turbulence, or a bumpy runway, can easily cause unsecured items to move. Especially in an aircraft with controls which cannot be reached from the pilot's position, it is essential that any items carried are secured so that they cannot move and restrict any of these controls.

The aircraft landed safely, and the pilot in his report acknowledges the considerable assistance he received from the air traffic services throughout. Remember, even if there is no-one else in the cockpit, we are not alone!

Transponder Mandatory Zone

We have been asked to remind pilots that flight through a notified TMZ such as that around Stansted normally requires the aircraft to be fitted with a serviceable and working **Mode S** transponder. The Stansted TMZ is that Class G airspace underneath the parts of the Stansted CTA with a base of 1500 feet amsl.



However, as described in the UK AIP aerodrome section AD-2 -EGSS, the pilot of an aircraft that wishes to operate in the Stansted TMZ without serviceable Mode S transponder equipment may be granted access to it subject to specific ATC approval. This approval may be obtained from Farnborough Radar on frequency 132.800 during their hours of operation (0800-2000 Winter (Summer 1hr earlier)) or from Essex Radar on frequency 120.625, at other times. If you don't have a Mode S transponder and you don't have permission, STAY OUT!

Unlatched canopies

We have often warned readers about the need to avoid being distracted by events such as doors coming open on take-off. At the same time, it must be remembered that some aircraft may experience serious performance reductions if doors or canopies come open, and the total loss of a door or cockpit canopy could result in possibly catastrophic damage to the structure and attached flying controls.

Several modern light aeroplanes have large cockpit canopies which are hinged at the front and latched at the rear. This arrangement would appear to reduce the risk of damaging the structure if the canopy were to unlatch in flight. However, the shape of such canopies is usually that of a three-dimensional convex curve, similar in an exaggerated form to the shape of the upper surface of a wing. If the latch at the rear of the canopy comes open in flight, the 'bernouilli effect' of the air flowing over the canopy will attempt to 'suck' the canopy open and hold it in a position well above the rest of the aircraft structure, possibly beyond the reach of the pilot if he were to attempt to close it again.

The air flowing over such an open canopy would interact with the slower moving air in the lee of it, generating turbulence resulting in drag. That drag may be sufficient to overcome the thrust available from the engine, forcing the aircraft to descend in order to maintain a safe airspeed, as the pilots of two separate aircraft involved in accidents reported in the AAIB Bulletin 10 of 2012 discovered. We should all be aware of the need to pay particular attention to the condition of our latches and to the security of our canopy before take-off. However, since air turbulence has been reported as the instigator of some unlatching events, we must also be aware of, and remain within, the manufacturer's recommended airspeeds for flight in turbulence.

The last option?

Elsewhere in this magazine we refer to a fatal ditching. It seems the pilot decided that, having become lost over the sea with no electrical power available to make a radio call, ditching his aircraft beside a ship offered the safest course of action.

It is quite possible that he was correct in his decision. However we would like to remind pilots of a procedure which, if able to fly at sufficient height, and fuel permits, may attract the attention of an air traffic controller with a radar set. A radar return which seems to be flying equilateral triangles in the sky is an indication to a UK military controller that an aircraft may be suffering from a radio failure and requires assistance. If a pilot flies straight for 2 minutes along each leg, followed by a sharp turn to the left (left if your radio has 'nothing left' – turn right if your receiver seems all right) through 120 degrees, a controller may notice the manoeuvre and send someone to investigate. Of course, selecting 7700 on our transponder, if we can, is much more likely to attract attention, and most transponders seem to require less power to operate than a radio receiver and so may still operate for a short while after the radio dies.

Magnetos

Cessna has recently informed multi-engine operators of Continental Motors Inc. Service Bulletin SB12-3 (or later revision) or Slick SB1-12 (Corrected Copy) (or later revision) drawing attention to failures recently identified in certain Slick magnetos that may have been installed as spares after November 1, 2011 to Cessna multi-engined aeroplanes, and recommending their replacement.

While normal power checks would be expected to identify magneto problems, these are usually carried out just before take-off, and discovering an unserviceable magneto at that point is likely to cause inconvenience at best. Until suspect components are repaired or replaced, Cessna recommends operators do post-flight magneto checks in addition to the required pre-flight magneto checks. These may help to sooner identify a magneto malfunction. It is not known whether other aircraft or engine manufacturers fit similar magnetos, but pilots may wish to consider carrying out similar post-flight magneto checks.

Mandatory Permit Directive

The following Mandatory Permit Directive (MPD) has recently been issued by the CAA. Compliance is mandatory for applicable aircraft operating on a UK CAA Permit to Fly. MPDs can be found at www.caa.co.uk/mpds. Owners of aircraft with Permits to Fly and their Continued Airworthiness Managers should register to receive automatic e-mail notification when a new MPD is added to the website, through www.caa.co.uk > Publications > Subscriptions > New User Subscription Registration, and choose the 'Safety Critical Information' category.

MPD 2012-004E	**Yeoman Dynamic WT9-UK**	**Fuel cock lever**

PLBs and ELTs

Readers will be aware that all 406 MHz PLBs and ELTs must be registered. As published in AIC P134/2012, the registration of these beacons for aircraft use has recently transferred fully to the UK Distress and Security Beacon Registry at the Falmouth MRCC.

This changes the registration address previously published in SafetySense leaflet 21c "Ditching", available like all such leaflets free for download from ww.caa.co.uk/safetysense. An amended SSL 21d will be available from the web site in the near future.

GA Safety Evenings 2012 - 13

GASCo, the GA Safety Council to which the CAA is a major contributor, is organising this winter's series of Safety Evenings. The evenings are of value to everyone involved in general aviation, whatever they fly, operate or maintain. Logbooks will be signed when requested as proof of attendance. The programme of currently confirmed events is shown below, but more will be announced when confirmation has been received.

For updated information, including more specific contact details for the organisers, see the CAA website www.caa.co.uk/safetyevenings or the GASCo site at www.gasco.org.uk. Organisations wishing to host a future safety evening should contact GASCo on 01634 200203 or by e-mail to office@gasco.org.uk.

Date	Time	Area	Venue	Contact
21 Nov	1930	Leicester	Leicester Aero Club, LE2 2FG	0116 2592360
23 Nov	1930	Blackbushe	The Bushe Cafe, GU17 9LB	01252 877727
4 Dec	1930	Bourn	Aerodrome building, CB23 2TQ	01954 719602
5 Dec	1930	Seething	Clubhouse, NR15 1EL	07976 661784
6 Dec	1930	Saltby	Buckminster Gliding Club, NG33 5HR	07790 914198
10 Jan	TBA	Enstone	Enstone Flying Club	
11 Jan	1930	East Midlands	The Whitehouse Hotel, Kegworth DE74 2DF	01332 810444
14 Jan	1930	Southend	The Flight Centre, SS2 6YF	01702 546420
15 Jan	1930	Rochester	Holiday Inn, Maidstone Road ME5 9SF	01634 869968
16 Jan	1930	Lydd	Biggles Restaurant, TN2 9QL	01797 320734
17 Jan	1930	Goodwood	Goodwood House PO18 0PX	01243 755066
25 Jan	1930	Andrewsfield	Andrewsfield Aviation, CM6 3TH	01371 856744
7 Feb	1930	Nottingham	Truman Aviation, Tollerton, NG12 4GA	01159 815050
7 Mar	1030	Gransden Lodge	Cambridge Gliding Centre, SG19 3EB	07801 398714
14 Mar	1930	Devon LAA	The Ley Arms, Kenn, EX6 7EY	07776 075996
18 Mar	1930	Glasgow Airport	Glasgow Flying Club, PA4 9LP	0141 899 4565
19 Mar	1930	Fife (Glenrothes)	Tipsy Nipper Restaurant, KY6 2SL	01592 610436