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Busy R/T

Pilots flying at or near busy aerodromes are aware that it is often difficult to "get a word in edgeways". It is important, in some cases vital, to make one's radio calls as accurate, brief, and clear as possible, in order to reduce the time spent transmitting, thereby making time for others to call.

One way of reducing transmission time is to make full use of the facilities available. Many busy aerodromes provide information in the form of a broadcast by an Aerodrome Terminal Information Service (ATIS), which is usually available on a separate frequency and may also be available by telephone, as listed in GETMET 2012, available from the Met office website www.metoffice.gov.uk/aviation/ga. The broadcast normally includes a code letter. If pilots calling for taxi or aerodrome traffic pattern joining clearance include the code letter with their initial transmission, the controller knows that the pilot has much of the necessary information, and he does not need to repeat it.

Another way of reducing transmission time is to prepare for the call before making it. That involves not only preparing the call you yourself will make, but also working out what the likely replies should be, and what you will say in return. In any case, do not think with your finger pressing on the transmit button – if you become unsure, release the button, think again while allowing others to make their calls, then continue the transmission when you are ready for the next series of calls.

Hold it there!

A recent incident report concerned a Robinson R44. During routine maintenance, a rod in the main rotor pitch link was found to be bent. The report suggests a possible cause may have been that the blades had been allowed to flap excessively while the aircraft was parked outside.

High and gusty surface winds are experienced relatively frequently in this country, often stronger than forecast.

Most commercial operators tie their rotor blades down as a matter of routine when their aircraft are left outside, as recommended in Flight Manuals. Perhaps all owners and pilots should consider doing the same?

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 and the FAA; however, this list is not exhaustive and must not be relied on.

Number	Applicability	Description
EASA 2012-0085-E	Eurocopter EC135, 635	Main Rotor Hub
FAA AD 2012-10-52-E	Cessna 206, 207, 210	HET (Hartzell) Turbochargers
EASA 2012-0075-E	Cessna 182 with SMA SR305-230	Turbocharger Hoses (Correction)
EASA 2012-0086-E	Agusta Westland AB412, 412EP	Hoist Hook
EASA 2012-0087-E	Eurocopter EC225	Main Gear Box Bevel Gear
EASA 2012-0097-E	Rotax 912 engines	Fuel pump pressure hose
EASA 2012-0098-E	Eurocopter SA365, AS365, EC155	Flight Manual Emergency Procedures

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Short field takeoffs and climbing at best angle (V_X)

A report in the AAIB's Bulletin 4 of 2012 concerns a PA-38 which was climbing after take-off when it suffered a sudden engine failure at about 200 feet. The aircraft stalled and crashed into buildings, and although the crew survived the crash, they suffered further injuries in the subsequent fire, and the pilot died later in hospital. The investigation concluded that the most likely cause of the engine stoppage was a stiffness of the fuel selector valve causing it to be in an intermediate position, reducing fuel flow to a level too low to sustain continuous engine operation.

As was apparently normal from that aerodrome, it seems the pilot had used a short take-off technique, and was climbing at or close to the speed for best angle of climb V_X, which is only very slightly above the speed for minimum power required. However, if thrust is lost in the high nose attitude required for a V_X climb, drag will cause a reduction in the aeroplane's airspeed, even if the pilot starts to lower the nose immediately. As speed reduces, drag continues to increase, so unless the nose attitude is selected to a much lower position than required during a normal engine failure drill, the aircraft will continue to decelerate. Since V_X is usually not much higher than the stall speed in level flight, there is a high risk that the aeroplane might stall before the speed starts to increase again, with the additional risk that the possible stall symptom of "wing drop" would be exacerbated by the rudder position, since it is no longer required to balance the previous high power setting. As the report suggests, a pilot suffering an engine failure from V_X just after take-off has very little time available to initiate the correct action.

If the pilot manages to start lowering the nose before the aeroplane actually stalls, the pitch change downwards will reduce the wing loading while it is taking place, and may well keep the angle of attack below the critical angle until gravity starts to accelerate the aeroplane. However, this will only happen if the gliding attitude selected is steep enough, and, as stated earlier, much steeper than that normally required after a simulated engine failure from a shallower and faster climb. Once the necessary glide approach speed has been regained, of course, the aircraft attitude can (and must) be returned to a more familiar glide approach attitude. At low heights, the pilot has to balance accelerating (or reducing deceleration) and height loss against the need to initiate the landing flare.

As can be imagined, practising engine failure drills from V_X at low heights is fraught with risk, and instructors are advised to make any practices at a safe height, while emphasising that the attitude change required in the real case will be greater than that required during the practice, and even greater if the failure is not instantly recognised.

Before take-off, pilots are encouraged to consider possible eventualities. If carrying out a short field (or 'performance') take-off, and/or climbing at V_X to clear obstacles, that consideration should include the probable need for a very steep initial glide attitude following an engine failure, and the need to be prepared to select that attitude very quickly.

Stay away!

Recently, a Bell 206 flew close to a military aerodrome during flying operations without contacting the published approach frequency until the pilot appears to have seen aircraft in the visual circuit. It seems the pilot then apologised, stating that he was not aware the aerodrome was open.

SafetySense leaflet 26 "Visiting Military Aerodromes" provides guidance to pilots flying in the vicinity of military aerodromes, whether or not they intend landing there. While permission to enter a Military Aerodrome Traffic Zone is not mandatory, activity at many military aerodromes, including those apparently normally only operating light aeroplanes, can without warning include high speed and/or heavy aircraft which may have limited vision and manoeuvrability. A call on the published approach frequency 15 miles or 5 minutes before entering the MATZ is always strongly recommended!

However, another feature of military aerodromes is that they may have traffic operating within the visual circuit area even when the approach frequency is unmanned. Most military aerodromes have a permanently active ATZ which must be avoided unless the pilot has received positive clearance to enter it. As always, a lack of response on the radio does not constitute a clearance!

Flaps

Operators of types such as the Cessna 150, 172 or PA28 with flaps which can be selected to 40 degrees will be aware that the drag from such a flap setting is considerable. That drag has been known to overcome the thrust available from the engine during a go-around, especially in high ambient temperatures and low atmospheric pressure. Familiarisation training should emphasise the need to retract the drag flap at an early stage of the go-around, and the effect on the aircraft's control if that is not done. The correct technique should then be practised regularly at height as well as in the circuit pattern when required.

However, Cessna flaps are electrically operated, and we know that occasionally an electrical problem such as a blown fuse has prevented that flap retraction. This will make a go-around difficult at best. It may be that possibility which has influenced many pilots to only use full flap when carrying out or deliberately practising a short-field landing. That electrical operation also means that if the low volts light is illuminated and the battery is carrying the electrical load, "threat and error management" would suggest it would be inadvisable to make such a short field landing unless absolutely essential. If it is judged essential, full flap selection should not be made until the pilot is as sure as he can be that a go-around will not be required.

GPS Jamming Trials

AICs frequently describe GPS jamming trials being carried out in UK airspace by the armed forces, and several have taken place recently. In the near future, we are aware that trials are due to take place at Sennybridge in Wales between 11th and 29th June, affecting an area to the South and West and potentially over much of Wales and the West Midlands.

Although GPS should not be used as a primary means of navigation, pilots are reminded of the importance of checking NOTAMs through www.ais.org.uk.

Going abroad – check your licence!

When you land at an aerodrome outside the UK, you may be asked to produce your licence. As in the UK, the licence itself, the medical certificate, and any relevant rating, must be valid.

If any one or more appears invalid, it is unlikely that you will be permitted to continue your flight. Part of flight planning involves checking that your licence, ratings and medical are valid. In addition, if planning a trip abroad we suggest that you check well in advance that they, and your passport or equivalent, will not expire until after your intended return date, and on the day, make sure you are carrying those valid documents.

It is also important to check, if the licence held is only a National PPL, whether it is recognised by the country you intend to fly to or whether that country requires it to be validated prior to the intended visit, and/or has other requirements.

European radio communications

In the previous issue we mentioned CAP 413's multi-media GA supplement, available for download from the CAA's website at www.caa.co.uk/cap413. It is probably appropriate to mention the similar document for flight in continental Europe produced by the European GA safety team EGAST on their website www.easa.europa.eu/essi/egast, through "publications" then "brochures and leaflets".

But I knew exactly where I was!

We are grateful to an instructor for the following report, which highlights a possible human factors problem which can affect all of us.

"I normally fly in an area well away from controlled airspace. On this occasion I was providing glass cockpit differences training to a PPL holder in the Southeast of England. He had practised the use of the twin GPS which powered the Primary Flight Display and Multifunction Display as a back-up to visual navigation, and its use for weather avoidance. Before demonstrating the direct-to function to take us back home, I decided to give him practice at a forced landing pattern.

Entering the glide in the new type with the unfamiliar display proved awkward for him, so the first pattern was not completed. Neither was the second, around a different field. In order to give him more time to set up the pattern I suggested we climb higher, and move over lower ground. I was concentrating on correcting my student's handling, and explaining how to start the PFL pattern. Despite having referred to my chart minutes earlier, and the fact that a large MFD in front of me, and both GPS screens, indicated that we had crossed a marked boundary, my brain did not register the fact that the London TMA changed its base altitude in that direction.

Suddenly, and for no apparent reason, the framework of lines on the screen in front of me made a connection in my brain – that gap in the lines meant that the TMA base was only 2500 feet amsl in our area! Without pausing to identify exactly how high we had climbed I took control and started a rapid descent, cursing myself for an idiot. All that beautiful navigation kit and I'd infringed controlled airspace. I'd even briefed the CAS base specifically before the flight.

However, the real reason for submitting this report is not to demonstrate how easy it is to infringe controlled airspace when you get distracted. I had decided that I was going to be called on to explain my actions, and quite probably caused disruption in the flow of aircraft in or out of the nearby major aerodrome. I found that was preying on my mind, and the standard of my instructing dropped dramatically. Fortunately I was flying with a qualified pilot, so my inability to explain clearly what I wanted him to do caused no real harm; however, had conditions been awkward and the student required more of my attention, I dread to think what the consequences would have been. If something similar happens in the future I have decided that I should take control for the remainder of the flight, apologising to the student, and return to land once I have managed to regain my concentration.

As it happened, it seems the aircraft had not actually entered controlled airspace, so the stress and distraction this instructor experienced was unnecessary. However, his suggestion is valid; better no instruction than bad instruction. Nevertheless, we wish to point out that an inadvertent and acknowledged infringement of controlled airspace is unlikely to have serious consequences for the pilot. It is much more important for aviation safety to avoid it happening again (and we are pretty sure it won't to this instructor), so any investigation would normally concern itself with finding out the facts and agreeing corrective action.

Mandatory Permit Directives

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. All MPDs currently published in CAP 661 remain in force, and the 'Alphabetical Index' previously found in the front of the hardcopy of CAP 661 is now on the MPD webpage.

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 2012-002E	**Rotax 912UL, ULS**	**Fuel system and pump hose**

Summer heat

Climate change may be having a serious effect on UK weather, but there will probably be several high temperature days this summer. These may well coincide with suitable flying weather, which we may well wish to take advantage of.

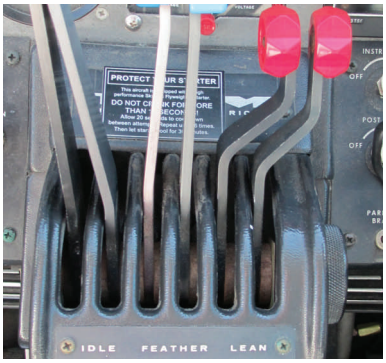
However, we need to remember that high temperatures can have serious effects on our performance. Cockpits can reach temperatures well above ambient, especially if they include large areas of perspex, and pilots could experience dehydration unless they drink sufficient water. Sunburn, apart from its own effects, can be associated with dehydration. Take water, cover your head and exposed areas of skin when you are in the cockpit or out and about on the airfield, and remember that you may remain relatively dehydrated because of alcohol long after its initial effects have worn off.

Of course, it is not only the pilot which may experience reduced performance. High air temperatures reduce air density and consequently reduce both engine power and the lift force available from the wing. Take-off distances can increase dramatically, so make sure you carry out performance calculations carefully.

It may also be worth considering the effects of temperature on your fuel. Fuel contents are normally indicated and checked by volume, but produce power by mass. A tank full of warm fuel will not contain as much calorific value as one containing cold fuel, and expansion in increasing heat may cause fuel to flow out of the vents. Hot fuel is more likely to vaporise in the fuel lines, producing gas bubbles which may not be cleared through pumps (vapour lock). Avgas should have no serious vaporisation problems, but the danger of vapour lock is the reason why the use of MOGAS is not permitted above temperatures of 20 degrees C. Refer to SafetySense leaflet 4, available free for download from the CAA web site www.caa.co.uk/safetysense. If our tanks contain MOGAS we need to either keep the fuel cool, or stop flying!

Stuck throttle?

Mainly to cater for the possibility of aerobatics shaking a foreign object into the linkage, military pilot students are frequently encouraged to practise their actions in the event of a throttle becoming stuck, either at a constant position or through a restricted range. There are several possible causes for a throttle restriction, and every case is different, challenging the pilot to make a careful analysis of the situation and assess possible actions to achieve a safe result.



However, it is not only military pilots who can experience the problem. As readers of the Occurrence Listing distributed with GASIL in March will have noticed, the test pilot of a Glasair recently experienced the loss of a bolt from the throttle linkage which kept his engine revolutions high and made reducing speed difficult. In the same edition, the pilot of a PA-28 was presented with a similar problem, but at a lower power setting, when his throttle cable broke. The April occurrence includes a Beech Duchess whose pilot was unable to change one engine's power setting on the approach when he appears to have lost part of the throttle linkage.

Throttles stuck at high rpm usually allow the pilot to reach an aerodrome with a long into-wind runway where he can set himself up on a forced landing pattern before shutting down the engine. However, being restricted to a low rpm may require careful handling to fly to a safe area. Perhaps we could all consider a variety of throttle restriction scenarios on the ground, just in case we ever experience the problem ourselves?

But the weather looked better than forecast!

Readers may remember an article in a recent issue concerning pilots being caught out by worsening weather. According to the BFU (German AAIB), the pilot of a Cessna 150 had obtained the weather forecast for a flight across high ground. It seems the GAFOR, which is a detailed area forecast for general aviation, indicated that across that part of the route, VFR flight below cloud would not be possible.

The pilot apparently believed that the weather at his departure aerodrome was better than the forecast suggested. He decided to attempt the flight, but after some time realised that VFR flight below cloud was not possible. He climbed above the cloud and continued along his route, as he was entitled to do. Approaching controlled airspace over considerable cloud cover, he eventually seems to have found a gap big enough to descend through.

According to the report, once below the cloud, he found himself unable to continue in any direction, and realised that his aircraft climb performance would not allow him to safely climb back through the gap. As a result, he was forced to make an emergency landing in a forested area, during which he suffered minor injuries and the aircraft was destroyed.

Weather forecasts may appear over-cautious, but are written with the benefit of considerable expertise and computer power. They should be disregarded at your peril. And those of us who can fly above cloud must not descend below safety altitude unless we can fly using visual references and climb back up again safely.

Watch your nuts

According to the BFU (German AAIB), a Diamond HK-36 Super Dimona had completed three flights on the day and the crew was taking off on a fourth, when the nose of the aircraft reared up, accompanied by a noise. The pitch up could not be countered by moving the control column forward, but at a height of about 40 feet the aircraft stalled and fell to earth. The crew were fortunately uninjured.

The elevator had become disconnected from the control linkage, and the investigation concluded that the bolt holding the linkage together inside the tailplane had fallen out as a result of being too short for the locknut which was fitted to it. The connection is invisible to normal daily inspections, and is apparently in an awkward position.

The investigation concluded that the bolt used for the connection was of a size approved by the manufacturer, but that the locknut fitted was probably incorrect. Instead of the flat locknut specified, a normal raised locknut had apparently been fitted, which did not grip on the threads and which could therefore fall off.

It is essential that the correct bolt (material specification, diameter and length) and the correct nut (material, diameter and depth) are used to ensure that the installation is maintained as designed. A general guide is that at least two threads would normally be visible following installation of the correct nut onto the correct bolt. This is particularly critical in installations where the connection cannot be inspected for security during routine pre-flight or pilot centred inspections. It should also be remembered that such connections require independent or duplicate inspections to be carried out.

Although damage seems to have been evident to the remainder of the linkage, the bolt had apparently held for some time, before choosing the particular take-off to fall out completely. A pilot confronted with such a problem would have very little time available to close the throttle before the aircraft reached a point where serious injury was likely.

Following the BFU's safety recommendation, it seems Mandatory Service Bulletins for HK36 and DA20 have been issued by the manufacturer.

Air Displays and Restrictions of Flying

Many flying displays and other events, including those for the Olympic Games, will be subject to Restrictions of Flying this summer, as detailed (usually with maps) in Mauve AICs. Reminders, usually referring to these AICs, may be given in NOTAMs, as will details of other displays, and all are available through the AIS website www.ais.org.uk, which is where all AICs can be found free of charge. Displays and other major events taking place over the next few months of which we are already aware are listed below, but others are likely to appear in NOTAMs at short notice, and checks should be made immediately before flight on the web site or the AIS information line 0500 354802 (+44 208 750 3939 from overseas). Restrictions covering a large area are highlighted in **bold**:

12-14 June	Waddington to Norfolk & beyond (flypast rehearsal)
14 June	Portishead, Bristol
15-17 June	RAF Cosford, West Midlands
15-17 June	Cholmondley Castle (South of Manchester)
16 June	Norfolk sea area to Brize Norton via London (flypast)
16 June	RAF Coningsby
17 June	Welshpool
20, 21 June	Stonehenge, by Boscombe Down
22, 23 June	RNAS Yeovilton
21 June	RAF Marham
23, 24 June	Lowestoft, Suffolk
24 June	Windermere
25 June – 9 July	London (Wimbledon)
28 June	RAF Cranwell
28 June – 1 July	RAF Waddington
29 June	Goodwood House, Chichester
30 June	Plymouth
30 June, 1 July	Duxford, Cambridgeshire
2-16 July	Farnborough Air Show
3 July	Southampton
3-5 July	West Wales (flypast rehearsal)
4 July	Feltwell, by RAF Lakenheath
4-9 July	Kemble to Brize Norton, Wiltshire (RIAT Fairford)
5 July	Farnborough
5 July	Isle of Man
5-9 July	Balado, Fife, Scotland
6- 8 July	Silverstone & Turweston
7, 8 July	Broad area Shawbury to Salisbury Plain (formation flypast)
12 July	Shrivenham, by Faringdon VRP
13 Jul – 8 Sep	Weymouth area (Olympic sailing)
20 July	RAF Valley
21 July	Rhyl
21, 22 July	Sunderland
23 July	Weston Super Mare
25 Jul – 9 Aug	Coventry (Olympics)
25 Jul – 3 Aug	Hampden Park, Glasgow (Olympics)
25 Jul – 10 Aug	Millennium Stadium Cardiff (Olympics)
26 Jul – 4 Aug	St James Park, Newcastle (Olympics)
26 Jul – 7 Aug	Old Trafford, Manchester (Olympics)
28 July	East Fortune
28, 29 July	Area Southwest of London CTR (Olympic cycle race)
29 July	Lyme Regis
29 July	Swanage
29 Jul – 2 Aug	Broxbourne, North of P114 (Olympics)
9-12 August	Eastbourne
11, 12 August	Hadleigh Farm, Southend (Olympics)

In addition, as part of the Olympic Airspace changes, which are detailed on www.olympics.airspacesafety.com, the London Restricted Zone EGR112 and Prohibited Zone EGP111 are active between **13 July and 15 August**, and the slightly smaller EGP114 is active between **15 August and 12 September.**