The RAF Total Safety Magazine

Issue 39

AirClues

Royal Canadian Air Force
Winter Ops

UK Airspace Classes Explained

STEP Training

ROYAL AIR FORCE Safety Centre

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Foreword

by the Inspector of Safety (RAF) Air Cdre Sam Sansome

Air Commodore Sam Sansome

Welcome to Issue 39 of Air Clues. 'It is not possible to step into the same river twice', or so Heraclitus the Obscure is reported to have said some 2,500 years ago. On the same theme he also said: 'There is nothing permanent except change'. If you are only going to be remembered in a couple of thousand years' time for having said 2 things - which is pretty much the case for Heraclitus - then I would say that they are a fine legacy.

Since the last edition of Air Clues so much has changed, but so much would appear to be the same - the water is different but otherwise the river seems identical. We have a new Monarch, but the Monarchy endures. The war in Ukraine is well-past its 200th day, things have felt decidedly different from the stalemate of the previous months, and our 'new normal' remains one of constant check and change - or Plan, Do, Check, Act, our familiar 'permanent' cycle of change. We continue to strive to keep up with, or get ahead of, the game.

For me that 'game' is safety and doing whatever I can to make sure that rush for change doesn't compromise a safe position and, where possible, to use the change to improve our safety further. In all cases, however, we need to recognise that getting the answer right first time - from a safety perspective - is a force multiplier. For ongoing activity, it doesn't really matter when you break into the cycle as eventually it comes back round, it is just important that you do. At the start of a project, however, getting Safety into the 'Plan' at the outset will always bear fruit - as well as keeping you legislatively compliant and the right side of regulation. My plea for you all is to think safety early.

As with Heraclitus' River, when you step into this edition you will find lots that is familiar, but also not the same. Stalwarts of Air Clues like 'I learned…' and 'Doc's corner' rub shoulders with articles about Snow Operations and Bird Radar (that's locating them rather than fitting to them….but who knows what's next). I hope you enjoy Edition 39 and maybe consider writing something for the 40th (Ruby!) edition.

We need your 'I learned about flying/engineering/air traffic from that' articles. Please write to Wg Cdr Spry with your open and honest stories.

Safety Awards

Double Green Endorsement Award! Flt Lt Preece - BBMF

Flight Lieutenant Preece received two RAF Safety Centre Green Endorsements within a 12-month period - an incredible achievement.

Green Endorsement #1. On 5 September 2021, Flt Lt Preece was pilot-in-command of a Battle of Britain Memorial Flight Spitfire returning from Prestwick Airport to RAF Coningsby. During his transit he noticed a strong smell of fuel. Whilst this often occurs when the wing tanks become empty in a Spitfire, the smell lingered for longer than usual. After confirming all switch selections were correct, he began venting the building fumes by opening the canopy hood. This initially succeeded, but shortly thereafter the smell returned, more strongly than before and would not clear. At this point Flt Lt Preece noticed a growing pool of fuel present on the cockpit floor. There are no Flight Reference Card Emergency Drills for a cockpit fuel leak and so he had to use his considerable experience to diagnose the problem and then handle the emergency. Uppermost in his mind was his appreciation that operating anything electrical in the presence of a significant amount of liquid and fuel vapour could be catastrophic for the aircraft and potentially fatal.

Flt Lt Preece knew the fuel tank was situated directly behind the engine which runs at extremely high temperatures, thus necessitating a rapid recovery and landing. He made a single short transmission to Carlisle Airfield announcing both his intention to divert and to cease all further radio transmissions. He set his transponder squawk to 'Emergency' and kept a sharp lookout for non-radio equipped General Aviation traffic operating from the airfield. He navigated to Carlisle and balanced the opposing risks of abandonment against that of using the electrical systems to lower the undercarriage. Despite knowing this could ignite the fuel, he deduced that lowering the landing gear was the safest course of action for both himself and those on the ground at Carlisle. He subsequently executed a flawless landing and taxied clear of all runways to keep the airfield safe, despite knowing this would prolong his personal exposure to the acute fire risk.

Green Endorsement #2. On 11 May 2022, Flt Lt Preece was once again pilot-in-command of a (different) Battle of Britain Memorial Flight Spitfire, this time tasked to undertake a partial test flight following repair work on the propellor mechanism that had previously experienced an oil leak. Having successfully completed the test, he recovered the aircraft towards RAF Coningsby. On final approach to land, he carried out his checks which includes a test of the brakes. This check confirms that both brakes are working and, crucially, that pneumatic pressure to each brake dissipates to zero. The test assures braking is available and dangerous asymmetric braking is not prevalent. It was at this point that Flt Lt Preece identified that the right-hand brake had retained full pressure. Despite the Flight Reference Cards (FRC) containing a check of brakes before landing, there is no FRC drill in the event that pressure does not dissipate to zero. Spitfires are notoriously challenging in the landing phase, especially with respect to directional control; therefore, to land one with a locked main wheel generates significant risk to both pilot and aircraft.

Given the aircraft had previously suffered an oil leak, Flt Lt Preece was conscious that further complications could result should he prolong his airborne time. Therefore, in the space of just a few minutes, he methodically diagnosed every potential scenario from the fault being an indication malfunction, to the worse case that the main wheel would remain locked on touchdown. In anticipation of the worst case, that would ultimately result in an uncontrollable swing to the right, he elected to use the main runway which, although presenting an adverse crosswind component, offered the most run off should a runway excursion occur. He also showed exceptional awareness to re-position crash vehicles to locations that would protect them and the aircraft from potential collision. Diverting to a grass strip and landing wheels up were also quickly considered and discounted by Flight Lieutenant Preece, who ultimately decided a known approach with SQEP crash cover in place would be the best and most expeditious option.

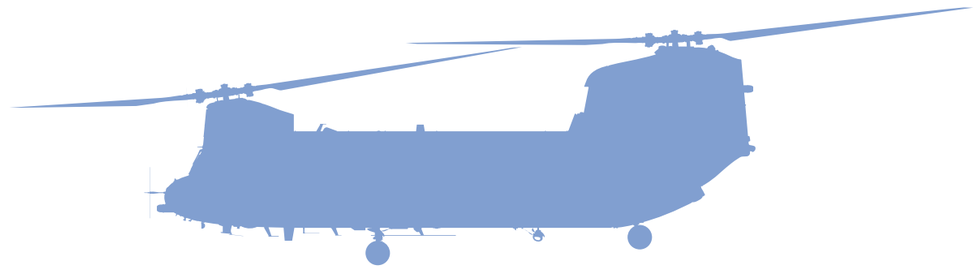
The approach and landing were flown to an exceptionally high standard despite the pressure and, on touch down, it was immediately apparent that the right main wheel was locked. Through his incredible handling skill, Flt Lt Preece managed to maintain directional control for approximately 1500ft of the landing roll. Furthermore, due to the locked main wheel, video of the incident shows the tail raising rapidly post touchdown which, if not corrected immediately, would have resulted in a propellor strike with the ground. Flight Lieutenant Preece resisted the temptation to use excessive left brake to keep the aircraft straight as again this would have resulted in the aircraft tipping forward onto its nose. Remarkably, he managed to keep the aircraft on the runway until the aircraft had slowed to about 30 kts, and rudder authority was lost, at which point the aircraft ground looped and entered the grass at the side of the runway.

Corporal Barber – 27 Sqn - RAF Odiham
Well Done

On 7 October 2021, whilst carrying out his duties in the 27 Sqn hangar at RAF Odiham, Cpl Barber identified several aircraft components situated on a workbench that had previously been in use when conducting work on an aircraft that was currently airborne. He checked other aircraft within the vicinity of the workbench to ensure that the components were not from any of these aircraft. In doing so he identified that the components were from an aircraft that was flying and that they should have been fitted prior to the aircraft being released for flight. The aircraft was quickly recalled to land.

Air Specialist 1 (Technician) O'Brien - 18 Sqn - RAF Odiham
Well Done

On 19 December 2021, whilst on deployed operations, AS1(T) O'Brien was the starter for the first Chinook aircraft of the day. During the engine start, as the main rotors began to turn, he drew the attention of a crew member to the left-hand forward pylon door. At first it was difficult to see any issue. However, based on his perseverance the pilot was instructed to shut down the aircraft. Once the rotor heads stopped, it was eventually apparent that one of the forward rotor head panels had become insecure during the aircraft start.



Flight Sergeant Clarkson – 18 Sqn – RAF Odiham
Well Done

On 25 April 2022 FS Clarkson was operating as number 1 (ramp) crewman on a routine airtest to the west of RAF Odiham in a Chinook helicopter. As the aircraft cleared Odiham's immediate airspace, Flight Sergeant Clarkson went heads-in to the cabin to carry out periodic scan checks of his ramp instrumentation. As well as carrying out the task assigned, and despite the routine and low-arousal nature of the task, he noticed something abnormal on the cabin wall in the vicinity of the number one engine. On further investigation he discovered an airframe crack, with daylight visible through the airframe as the aircraft manoeuvred. Aware that this was not mentioned in the aircraft maintenance manual, he informed the aircraft Captain and suggested a return to base, monitoring the area for propagation of the crack throughout. The aircraft was landed safely. The crack was almost invisible on the ground and the location of the crack was in a position that would not normally be examined closely in flight.

Mr Bolger – Babcock
Good Show

On 5 April 2022, Mr Bolger was a Babcock bowser driver assigned in support of the Southampton University Air Squadron (SUAS) flying programme at MOD Boscombe Down. After the morning brief, he collected one of 3 Renault 5000ltr AVGAS bowsers available to support the SUAS and 2AEF flying programmes. Prior to use, a refuelling pipe flush was required to be carried out. After removing the quick release refuelling nozzle from the fuel reel line and attaching the quick release fitting to the fuel recirculation point, Mr Bolger started the vehicle, engaged the Power Take Off and got out of the vehicle to monitor the fuel recirculation.

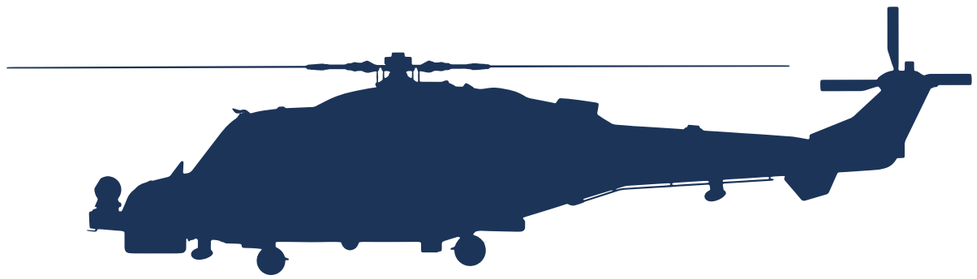
After approximately 250/300ltrs of fuel had flowed, without warning, blue smoke began billowing profusely from under the cab. Mr Bolger also saw a yellow colour appearing which he took to be a flame just above the engine. He instinctively pushed the Emergency Engine Stop to halt the fuel being pumped and grabbed the 6kg dry powder fire extinguisher, aimed it under the vehicle cab and attacked the fire from both sides of the vehicle. At the same time, he contacted Engineering Operations via hand-held radio to alert the Fire Section of the fire and the dangerous situation developing at the BFI. Having discharged the fire extinguisher on the burning bowser, he advised Engineering Operations that he would try to remove the other 2 Avgas Bowsers from the BFI as they were parked directly behind. He then drove the other bowsers out of the BFI and parked them at a safe distance to reduce any larger explosion risk.

PC Blakemore – Gibraltar Defence Police
Well Done

On 26 April 2022, at RAF Gibraltar, PC Blakemore was halfway through her shift at the airfield when she saw a lorry leaving a trail of fuel along the northbound carriageway of Winston Churchill Avenue and crossing RAF Gibraltar's runway. She quickly recognised the hazard to air safety and promptly reported the fuel spill to Air Traffic Control. This timely intervention ensured that the runway was made safe prior to the inbound the EasyJet and gave the controllers time to co-ordinate a holding pattern for the A320.

Corporal Burtle – MTSU – RAF Gibraltar
Well Done

On 12 May 2022, at RAF Gibraltar's eastern hangar, Cpl Burtle was completing his duties in the vehicle DI bay when he noticed a civilian entering the hangar and proceeding towards the controlled area near the Wildcat. He challenged the unknown individual for their ID. Once he had identified the individual as a contractor and identified their planned area of works, he asked the contractor for a check of tool control process; Cpl Burtle recognised how close the contractor would be to the controlled area and the air system. The contractor was unable to provide suitable assurance of tool control and so Cpl Burtle refused entry. His actions have indirectly provided a workaround that has provided the Wildcat detachment assurance that ongoing infrastructure projects can be safely co-ordinated, avoiding the need for interruptions and maintaining air safety. More broadly, Cpl Burtle's actions have opened up wider conversation around contractor assurance when airside at RAF Gibraltar.



Mr Richards – Voyager Force – RAF Brize Norton
Well Done

On 28 Nov 2021, at RAF Brize Norton, Mr Richards was performing a pre-departure walkround check of an A330 aircraft whilst being supervised by an instructor. This check would form part of his headset duties once signed off as being fully qualified. During this check, Mr Richards noticed that one of the latches on the rear cargo door control panel did not appear to be closed properly. He consulted one of the engineers who was still at the aircraft, and he confirmed that it wasn't closed correctly. The latch itself appeared to be in a higher position than others on the same and adjacent panels. The engineer boarded a scissor lift and positioned himself so that he was able to close the latch properly.

Mr Adkins – AirTanker – RAF Brize Norton
Well Done

On 8 March 2022 at RAF Brize Norton, Mr Adkins was the duty Air Tanker dispatcher seeing off an A330 aircraft which was bound for Tallinn, Estonia. Whilst conducting a walkaround prior to the aircraft's departure he noticed the front Cargo Door Latch was still open, a fact that had been missed by the Duty Movements staff upon closing the aircraft Hold. He quickly brought this information to the attention of the Movements staff who repositioned the steps and closed the Latch. His subsequent submission of a Safety Report also triggered a 'Message of the Week' and reminder within the Movements community of the importance of secondary checks during an AS turnaround.

Air Specialist 1 Elliot – 18(B) Sqn – RAF Odiham
Well Done

On 28 February 2022, at RAF Odiham, AS1 Elliot, an aircraft technician on 18 (B) Squadron B shift, was carrying out an after-flight servicing on a Chinook Mk6a aircraft. During the servicing he discovered that a Pitch Change Link (PCL) limiter, a crucial component within the upper flying controls, was lying loose on an inspection panel. He immediately highlighted the find to his line management. Whilst the servicing schedule does direct tradesman to inspect the general condition of the PCLs for damage, it does not direct them to check for the correct assembly or fitment of the limiter. His immediate identification of the item and his awareness of its significance directly contributed to the rectification of a flight safety critical component. Without his action the aircraft could have flown with a critical control assembly fitted in an incorrect configuration.

Sergeant Chubbock – SES – RAF Marham
Well Done

On 16 August 2021, Sergeant Chubbock was carrying out a full assurance check to ensure that all assets were being accurately managed, working with the Safety Equipment Bay to make comparisons between Autonomous Logistics Information System (ALIS) and Beacon Registration and Management System (BRAMS). He discovered that, should an Air Vehicle move between Squadrons, any updates carried out whilst in the Seat Survival Kit (SSK) Bay would then be voided on BRAMS as there was no mechanism in place to inform the SSK Bay or Sqns of the need to update the system. This could result in an Air Vehicle flying with the Pilot Flight Jacket beacon and respective SSK beacons registering different locations, potentially confusing UK Maritime and Coastguard Agency rescue co-ordination efforts and therefore hampering any timely recovery of the downed pilot.

Mr Littler – ATC – RAF Marham
Well Done

On Tuesday 1 February 2022, Mr Littler was the Duty Runway Caravan Controller at RAF Marham whilst a 617 Squadron pilot in an F-35B Lightning aircraft was conducting training within the visual circuit. During the approach to land, the aircraft had remained in conventional take-off/landing configuration despite a declaration by the pilot intending to undertake a 'slow' approach and it became apparent that the pilot had not converted the aircraft into the required mode for such an approach. As the aircraft began its final turn for the runway, Mr Littler visually assessed that it was not configured correctly and quickly passed this information to the Aerodrome Controller. The pilot abandoned the approach at a safe and early stage of flight with sufficient airspeed to establish a controlled re-entry to the visual pattern.

I Learned About Flying From That! Chinook Over-Torque

Submitted by JHC

Earlier this year I was flying a Chinook Helicopter on Ops and a routine night ended with a double engine change for the Engineering Team. Some old but still relevant lessons fell out of this, which I will share with you here. As with most Air Safety incidents there was not one single factor that led to this event but multiple factors lining up. I had been deployed on operations for a month by this point and it was my 6th time visiting the same theatre, it would be fair to say I was comfortable with the tasking I was handed that evening.

The first contributing factor, through no fault of his own, was that it was my non-handling Pilot s (NHP) first time on Ops, and his first flight. I was therefore to conduct a Theatre Familiarisation with him, which would include a more in-depth brief on how we operate at the various Forward Operating Base (FOB) locations. Whilst we were out flying the sortie I would help with the navigation, pointing out key features along the standard routes, and more importantly lead in features around the FOBs - to assist on dark nights or when flying in unfavourable weather.

The second factor was due to a change in the J2 picture that evening. Without going into detail, this forced our hand with regards to refuel locations that night, meaning we had to take our fuel from one FOB, and a lot more of it than standard.

Cut forward to later that night. We had just picked up 19 troops from the Main Operating Base (MOB) and completed our refuel which, along with the freight we already had on board, placed us significantly heavier than was normal, in the region of 21.5 tonnes. Lifting from here it was only a 5-minute hop to the next FOB; the NHP carried out his checks during the compressed timeline, after which I continued to draw his eyes onto lead in features to easily find the landing site. In the Chinook, as part of the pre landing checks, we state the wind direction, which on this occasion was downwind for the approach. I would estimate that by this point I had landed at this location upwards of 50 times, and almost every time the prevailing wind places the aircraft downwind. Hence, my ears didn t really prick up to this, although they should have, as we were actually 20-25kts downwind, which was much stronger than forecast. Why not change the approach direction I hear you ask? A good question, however, this particular landing site has terrain surrounding it on all sides apart from one. An approach from any other direction would lead to a clumsy approach from an uncomfortable height in the latter stages. Looking back on this night, that may well have been a safer option, and if I had been more aware of the severity of the wind perhaps that would have changed our decision making as a crew.

I am sure you can all see what is coming. During the approach after pointing out the landing site, I entered a standard deceleration profile and the NHP went back to his duties. By this point we were already too fast on the approach. The NHP called "0.6 nm - hot and I increased the nose up, to little effect. A second call of "0.3 nm - still hot came from the NHP. I elected to turn the tail, this should increase the braking effect of the rotor disc, assisting with the deceleration. In normal conditions this would stop a Chinook very quickly, on this occasion it did not, the NHP called watch your rate of descent mate , at which point I pulled in power and conducted an overshoot from the site. During this process, in order to initiate a climb and clear the previously mentioned high ground, I had to transiently pull 138% torque, exceeding the limitations of a Chinook.

At this point I fell fairly silent and flew a circuit to intercept the approach again. The lead crewman started checking everyone on intercom was alright, which kicked me back into gear. I proceeded to shoot a much, much slower approach which still felt too fast for the conditions, and this is when I realised just how far I was from a safe approach first time around.

Once safely on the ground we looked through the Flight Reference Cards and the other documents we had available and confirmed we had gone over the max contingency torque available; we then decided to reach back to the Eng team for advice. After informing them of the situation and everyone having had a good dig through the documents, we were instructed that it was at the aircraft Captain s discretion as to whether to continue the sortie or not. This was on the proviso that we were sure we hadn t exceeded 150% torque and had not had any other exceedances. An interrogation of the Health and Usage Monitoring System (HUMS) only showed a torque exceedance and no others. As it was only an extra 30 minutes to complete tasking rather than return to base we elected to continue. It is worth noting for all the Chinook Operators out there that N1 does not show as an exceedance on the HUMS, and we had actually pulled 3% over the upper N1 limit, had we known this we would have opted to shut down and get engineering support brought to our location.

At the end of the night we sat down for a sobering debrief - every member of the crew voiced the same thought - we all should have called for an overshoot earlier in the approach. This brought out one of the main learning points, never be too proud to initiate an overshoot as the Handling Pilot (HP), and you should never feel that because you have less experience than the HP, that they are always going to be all over it, or that you can t call for an overshoot as soon as you feel it's necessary.

Being an experienced Chinook Pilot, it is easy to pay lip service to the wind and forget that the lessons learnt back in Shawbury still ring true today, regardless of helicopter type or experience THINK WIND!

A reminder for the crewmen:
As the narrative above from the HP shows, this was a night of many debrief points. However, with all the opportunities to have changed the ultimate outcome, none are clearer to me than the lack of an overshoot call. As somebody who flies regularly with student pilots and crewmen, I find I am frequently highlighting to crews the phases of flight where we are nearing overshoot parameters or calling it on their behalf. So, the inaction by myself was somewhat of a puzzle to me at first.

On reflection, I know I was complacent with the approach. I felt the run in was fast, yet I thought the turn of the tail would wash off the speed. I thought the approach was uncomfortable, but I fell into the age old trap of 'he's got this'.

I know the HP well, an experienced pilot who instructs alongside me. Rather than the usual caution I would place on any approach, by the time I realised a successful approach was no longer viable, the overshoot had been initiated. It's a stark reminder that every crewmember owes it to the HP, (regardless of experience) to raise concerns when they have them. A warning raised from another crewmember may be just the confirmatory cue the HP needs to make a decision they were already forming - to begin an overshoot sooner rather than later! Giving a HP more leeway because of their experience doesn t do anybody any favours, it simply reduces the standard of service usually expected from the rear of the aircraft.

Civil Insights From the UK Flight Safety Committee
Temperatures and Pressures

by Air Cdre (Retd) Dai Whittingham, Chief Executive, UK Flight Safety Committee

The CAA recently issued a Safety Notice (SN-2022/005) entitled "Commercial, Organisational and Client Pressure in Flight Operations". Whilst the original trigger for this SN may have merged from the world of business aviation, there is no doubt that it is been a timely reminder about the insidious nature of pressures for all engaged in commercial aviation. Once again, there are parallels here for military operations.

The situation that now prevails in many areas of the system is unprecedented. It will not have escaped your attention, especially if you have travelled by civil air in the last few months, that there have been "one or two problems" with having the right moving parts in place to deliver an efficient service. Some airports have fared better than others, but the straight fact is that the industry has suffered a wholescale loss of trained manpower, with a concomitant reduction in intellectual capital, because of some of the short-term decisions taken during the pandemic. What we see now is an industry that is short-staffed in many areas, with the shortfalls adding to the pressures on everyone.

As anyone who has been involved with training will happily tell you, speed and accuracy of task completion increases as new people build up experience and hone their skills. Unfortunately, people with skills and experience are also the most expensive to employ and therefore proved to be a juicy target when savings need to be made. At one large UK airport, 2 members of staff were made redundant within 2 months of the first Covid-19 lockdown, taking with them a combined 63 years of experience of managing safety and regulatory compliance and an encyclopaedic knowledge of the airport and its legislative domain.

Everybody moves on at some point and there is normally a plan to train and replace them, but not on this occasion. The result was a weakening of the safety management system which you can attribute directly to the decision to target the most expensive assets. On the other side of the coin, the people making those decisions were themselves under pressure to reduce business costs despite having few levers to pull because of the absence of paying customers.

Some pinch-point trades mostly require manual skills and ought to be easy to fill, for example, baggage handlers. Besides the need to train new hires, working airside requires a security clearance, and that takes time. It also takes people who want to do the job in the first place.

Pre-pandemic, it was steady if hard work but, during the interregnum, many found alternative employment that was less demanding but paid equally well. The same is true of airport security staff.

The confident predictions that staff would return to the fold once activity re-started have proven to be well-wide of the mark. People have opted to remain in their new lines of business, with many enjoying different working patterns and increased personal control of their working lives. But all this has increased the pressures on the system.

SN-2022/005 addresses the many ways that these pressures can manifest, noting that ops control teams, business managers and flight crew can have very different priorities and potential outcomes can vary accordingly. And here is one of the parallels for military aviation. Pressures can lead you to taking decisions or action that would not normally be the case.

There has been plenty written about press-on-itis over the years, but events have typically involved going into bad weather or carrying snags when the sensible decision would have been to divert or not go in the first place. Commercial air transport crews often find themselves under pressure because they know that, ultimately, the company will foot the bill and therefore not doing something may count against them at a personal level (for example, redundancy selections).

A long-haul aircraft captain faced with a potential delay of more than 4 hours because someone is outside the Flight Time Limitations scheme will know that his company will face a compensation bill of £150K or more just for the initial delay. If that delay is overnight, you can add HOTAC and other subsistence costs too. The pressure to operate becomes substantial.

Similarly, it is remarkable that many Minimum Equipment List (MEL) faults emerge on the inbound leg. Those 'no go' items are labelled as such for a reason, i.e. that safe operation can't be guaranteed, yet it's often more convenient to ignore them for the early legs of a multi-sector short-haul day. And, of course, eroding the safety margins in this way keeps the customers happy and the company out of the news. One day though, the additional risk will materialise with potentially disastrous consequences.

The MEL is part of the airworthiness system, and you should adhere to it. If there is ever a need to accept a deviation (such as for battle damage repairs), there is a process whereby someone at the appropriate level in the command chain balances the operational imperative against the additional Risk to Life. I still recall accepting a fully armed aircraft for QRA at RS30 in an operational theatre and finding a red-line entry in the F700 which read: "FOD DAMAGE TO RIGHT ECU. WAR SORTIES ONLY." That's OK… Lastly, with a nod to Mr Boyle and his Law, there is a direct link between temperature and pressure. In the context of the commercial industry, the temperature element is perhaps more accurately referred to as 'temper', which is also true for military aviation. When discussions become heated or people become frustrated (which is happening a lot), you end up with a distraction either because of the impact on self or through the behaviour of others. Think about the last time the transport was late, or the building hadn't been open on time, etc. The increased temperatures also increase pressures throughout the system.

The CAA Safety Notice referred to commercial, organisational and client pressures. You can translate those terms into mil-speak however you wish, but it is worth bearing in mind recent conversations in the civil safety space to the effect that pressures are the forces that push you towards hazards. There is often little that can be done about hazards directly, but there is usually something that can be achieved to reduce pressures through good leadership and management.

Fire Doors (Again)

By FS Richard 'Bomber Lancaster, RAF Safety Centre Fire Officer

In the early hours of 27 July 22, a fire broke out within a Single Living Accommodation (SLA) block at RAF Benson. The cause of the fire was attributed to a faulty tumble dryer, which had been the subject of a recall notice that had been issued several years prior to the fire, which had been missed. This incident again shows the effectiveness of the fire doors in the building which contained the fire and prevented significant fire spread throughout the premises. The containment of the fire, along with the level of automatic fire detection giving early warning to the occupants, undoubtedly allowed the occupants to escape to safety and prevented serious injury and loss of life. It's another timely reminder that fire doors should always be closed to allow them to work to optimum effectiveness.

Fire doors work by sealing shut into the door frame, providing a physical barrier that will withstand fire for a specific length of time. Different constructions provide different protection depending on the risk of fire in the area where the door is installed, but most fire doors are typically designed to withstand fire for 30 minutes.

Any glazing or vents that are fitted in the doors need to conform to high standards so as not to compromise the fire rating of the door. There is a strip of material installed in the door or frame construction, known as intumescent strip. When this material is exposed to heat from the fire it expands and prevents the door from opening through pressure changes, essentially sealing the door in the frame. Fittings, hinges, and the self-closing devices are also tested and need to meet rigorous standards, failure of any part of the door set would leave a weak spot for the fire to break through. A well designed, correctly installed fire door will limit the spread of fire. A poorly designed or incorrectly fitted is not going to offer the same level of protection. Across Defence there is a worrying practise of wedging open fire doors in workplaces and SLA, but this increases the risk to our personnel in the event of a fire. A door that has been wedged open with a door wedge will not close automatically into the frame, making it impossible for it to provide that physical barrier. Fire will quickly spread to different areas of the building in this scenario; in the most extreme scenario this could lead to fatalities resulting from the incident. Monthly building custodian checks should look to remove items holding open fire doors, but all personnel have a duty of care to remove these items when found.

Top causes of electrical fires and how to prevent them

Most electrical fires are caused by overloaded sockets, faulty electrics, appliances, and wiring, you can help prevent them by making sure you:

- Only buy an appliance if it has a British or European safety mark on it.

- Unplug appliances at night or when you're not using them (unless they're designed to be left on like your fridge and freezer).

- Only use appliances like dishwashers, washing machines and tumble dryers when you're at home and awake.

- Keep appliances clean and in good working order to prevent them from causing a fire.

- Charge appliances like laptops and phones on a hard surface like a table. Only charge them when you're awake and in the house.

- Keep your laptop on a hard surface when it's in use or on.

- Don't put items on top of electrical equipment, cables, or lamps.

Plugs and sockets

Look out for signs of dangerous or loose wiring, such as scorch marks, hot plugs and sockets, fuses that blow often, flickering lights and circuit breakers that trip for no obvious reasons. Only use one plug per socket. If you need to use more plugs than there are sockets, use a bar type extension cable and don't plug in more than 13 amps in total. We advise against using block plug adapters, as they can get hot and start to pull out of the socket from the weight of the plugs and cables. Standard multi-socket fused extension leads are safer to use. Some appliances (like washing machines and kettles) are very high powered and should have a single plug to themselves. Never cut off sealed plugs to use again. Look out for signs of badly wired plugs. Any coloured wires sticking out could come loose and debris could find its way into the plug, causing a fire hazard.

Cables and leads

- Extension leads and adapters have a limit to how many amps they can take, so don't overload them.

- Check cables and leads regularly for signs of fraying or damage. Make sure that the outer covering of all power leads is in good condition and replace if necessary.

- Only use cables where they can be seen. Cables under carpets and rugs can wear through without anyone noticing and can easily be tripped over.

- Keep cables and leads away from water, cookers, and other sources of heat.

- Extension leads that are coiled or rolled up need to be unfurled completely before use, to stop them heating up

Lights

- Keep lamps and bulbs away from curtains and other fabrics. Bulbs can get hot and easily set materials alight.

- If you have a light in your airing cupboard, make sure bedding and towels aren't stored too high and close to the bulb.

- Choose LED lighting or bulbs which stay cool even when in use.

- Using an incorrect bulb can cause your electrics to trip and even start a fire.

- Only use a qualified electrician to install lights (such as down-lighters).

Electric heaters

Most heater fires are caused by sitting too close to them, standing them near curtains and furniture or using them to dry washing. With electric heaters, you should:

- Always follow the manufacturer's instructions.

- Keep heaters at least one metre away from furniture and curtains.

- Only move a heater if it's switched off.

- Turn off and unplug heaters before going out or going to sleep.

- Use fireguards to prevent children and pets from touching the heaters.

- Never dry washing on heaters or put anything on top that will obstruct the air grilles.

- Try to secure them to stop them falling over.

- Make sure your heater has annual portable appliance testing (PAT) to check for any faults. If your heater shows any signs of damage or stops working properly, don't use it.

Further Information

For further information regarding Fire Safety in the workplace contact your unit Fire Safety team or Establishment Fire Focal Point in the first instance.

Further advice available on the HM Government Fire Kills Website (https://firekills.campaign.gov.uk/) which is the current national Fire Safety campaign offering further practical Fire Safety advice

RAF Lossiemouth Bird Radar Trial – Trial WINCHELL

By Robin Radar Systems

Bird strikes pose a severe threat to military aircraft. Although fatal accidents are rare, bird strikes can cause considerable damage to aircraft, which can be expensive and debilitating – keeping aircraft grounded and dysfunctional. Most bird activity happens in lower airspace, so bird strikes are most likely to occur during take-off, initial climb, and landing. Military aircraft are at an increased risk than civil aircraft, as military training and operations often occupy the lower airspace around the airbase.

The decision to base the Poseidon at RAF Lossiemouth required a review of the bird strike risk due to the increased risk-to-life (RtL) of a multi-crew platform operating from an airfield with a high local bird population. Work had previously been ongoing for the provision of a Bird Detection System (BDS) at Lossiemouth since the arrival of Typhoon but had not secured funding. Following the submission of a Duty Holder Advice note to AOC 1Gp on the P-8A Birdstrike RtL, the direction to run a trial of a BDS at Lossiemouth was given. The Rapid Capabilities Office (RCO), Robin Radar Systems and RAF Lossiemouth had less than six months to find & deliver a solution, and Trial WINCHELL was initiated.

This project required the RCO, the Lossiemouth Team and Robin Radar Systems to identify a suitable system for the trial; identify a suitable site for the radar; deliver the infra and utilities to the approved bare bones site; obtain frequency clearance to operate the radar, and have the radar delivered and installed from the Netherlands within six months. This was to be completed during the COVID-19 pandemic and with Lossiemouth mid-way through a huge runway resurfacing programme.

The mission outcome? Success. After some excellent work by the RCO, Robin Radar Systems and Lossiemouth, a MAX® advanced BDS was installed and operational to support the start of P-8A operations in November 2020. After completing the successful 18-month 'proof of concept' trial period, the Dutch company, Robin Radar Systems, was awarded a 5-year contract for the provision of a BDS at RAF Lossiemouth.

Over the past two years, the radar system has continually gathered 24/7 relevant data about bird movements over and near the airfield, assisting in planning and managing the risks posed by birds to flight operations.

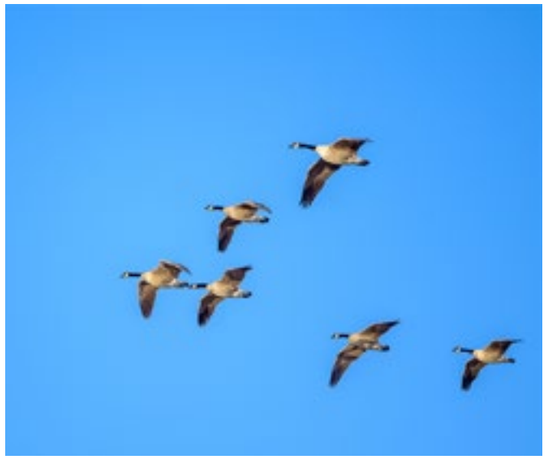
The radar can detect and log hundreds of birds at once, including their size, speed, direction, and flight path, which makes it the ideal solution for a large site spanning a wide area like Lossie. The technology can also be integrated with other systems to trigger warnings or preventative action. The radar detects bird activity day and night and can continuously measure the number of birds entering a particular airfield area. It can also initiate alerts before threats become visible or when birds cross a designated threshold. Before an alert is triggered, many factors are considered, including wind direction, bird behaviour, time of day, and the season.

Speaking on Lossiemouth's particular vulnerability to bird hazards, a Squadron Leader from the station said: "Lossiemouth has a unique bird strike risk due to being a coastal airfield surrounded by farmland containing a large number of pig farms. There are high numbers of corvids and seagulls in the vicinity of the RAF base, and every winter, around 10,000 geese arrive in Findhorn Bay. This high level of activity, combined with the statistic that around 80% of bird strikes in the UK happen at, or in the vicinity of, airports highlights the value of having an in-depth understanding of the avian picture."

Before the introduction of the MAX®, Lossiemouth minimised flying activity during peak bird activity to mitigate the bird strike risk. This restriction impacted planning and reduced operational flexibility, especially for the P-8A due to its sortie profiles. The BDS provides real-time height and positional information of airborne targets in 360° and can accurately track avian activity as far as 10km. Over the past two years, the confidence in the BDS performance has facilitated the development of effective operational procedures. The data provided by the BDS has also enabled Lossiemouth to reduce the level of restriction on operations during peak bird times, which has increased the flying window.

Photo: MAX® Advanced Bird Detection System

A Squadron Leader and member of the Poseidon crew at the station said: *"I was extremely impressed with how accurate it was. It seemed to accurately depict, not only the number and size of the birds, but the height, location and direction of travel."* The findings from the trial will also provide valuable future research for other RAF stations, tackling the threat of bird strikes in a more strategic way to reduce the danger and impact of bird strikes at military air bases.



Pexels.com: Brett Sayles

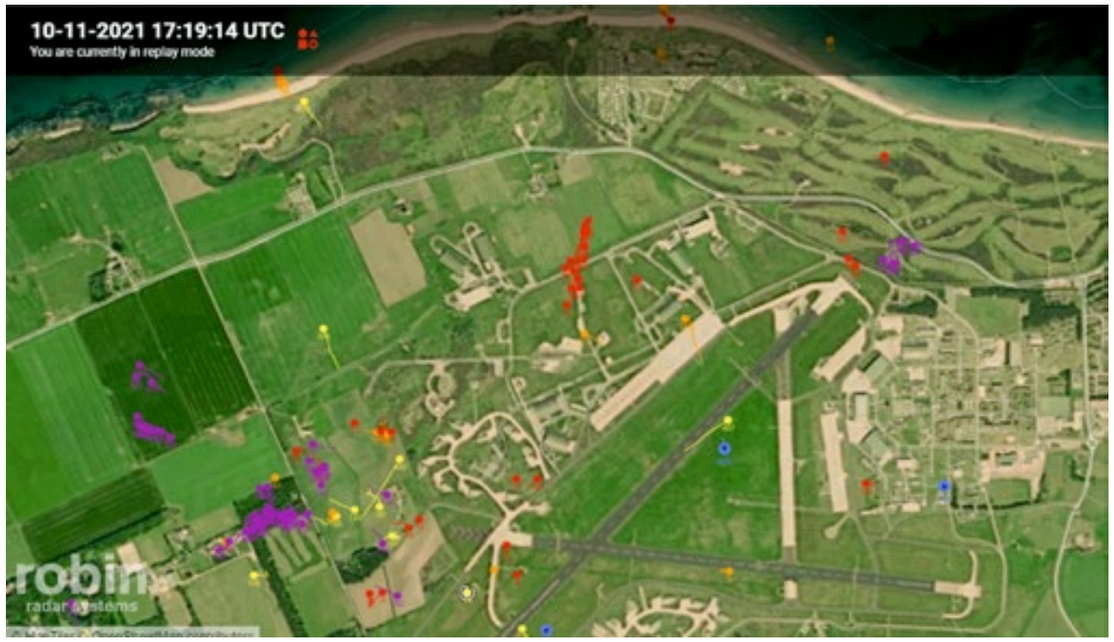
Example of the BDS in action at Lossiemouth

On 10 Nov 21, RAF Lossiemouth's new BDS capabilities were demonstrated to good effect.

At 17:11, while an RAF P-8 was inbound for an ILS approach, MAX® detected potentially hazardous bird activity over runway 23.

17:11 P-8 inbound for an ILS approach. Radar detects a high bird return over the 05 cable, with the flock tracking SE-NW at an altitude of 1100ft on 1013hPa. Air system breaks off at 4.5 miles.

17:17 A second return shows high bird activity further up the cable and crossing the runway from SSE-NNW. Approximate height 600 - 1000ft.



17:19 Radar detects another large return just off the runway 23 threshold tracking E-W at approximately 600ft. P-8 at downwind leg of RTC.

17:23 Radar detects two large flocks over the intersection and north side of runway 23, tracking E-W and S-N between 550-1000ft. P-8 within 4 miles of the runway and awaiting clearance. The supervisor instructs the controller to break off the approach.

Images provided by RAF Lossiemouth – Crown Copyright 2021

17:30 Another flock is detected over the intersection. However, this one is stationary at an altitude of 300-800ft. This causes the contacts to merge and makes height visibility unclear. P-8 downwind of the RTC for a further ILS to land.

17:31 P-8 on final approach and awaiting clearance to land. The radar shows no large bird returns on or above the runway. One flock, tracking NE-SW, turns directly W after the aircraft has passed. P-8 lands safely.

Radar to the Rescue

Thanks to the real-time data provided by the BDS to the Bird Control Unit and the ATC Supervisor using the tablet displays, the ATC supervisor was given an advanced warning of potentially hazardous bird activity around runway 23. This enabled both the Bird Control Unit and the ATC Supervisor to monitor and track nearby flocks accurately, aiding recovery and reducing the bird strike risk. Due to night-time conditions, it was unclear whether the human eye could have replicated the radar returns.

In this instance, the approaching Poseidon got an advanced warning of bird location and activity. During high bird activity, these flocks were monitored and tracked by the BDS, assisting with the recovery. Without the available data, the Poseidon would likely have continued to land on first approach, without knowing the potential severity of the bird flock ahead of it. This scenario is an excellent example of how the use of the BDS capability can reduce the Lossiemouth bird strike risk.

RAF Lossiemouth's Bird Control Unit Wildlife Manager:
"Airfield Wildlife Control Operators are active on the airfield during all flying hours to detect and disperse any bird activity. Since the radar has come into force, they have access to an in-vehicle tablet, which allows them to track the birds' movements detected by the radar in real-time and pass on any potentially dangerous bird activity to the controllers in the tower to communicate with the pilots. The radar has especially proven its benefit during periods of darkness, where the wildlife operators previously had limited visibility and had to rely more on their auditory sense; now, they have a visual aid in the radar.
In addition, the radar outputs all data collected, including but not limited to the number of near-misses, birds crossing the runway and exact bird hot spot areas. The Wildlife Hazard Management Unit can now access and analyse this information to better understand and predict local bird patterns and trends."

RAF Lossiemouth's Trial WINCHELL and BDS Project Lead:
"The success of Trial WINCHELL has resulted in the provision of highly capable BDS at LOS, with LOS currently being the only airfield in the UK with this capability. During and post-Trial WINCHELL, the BDS has proven to be effective in helping to reduce the bird strike risk at LOS, enabling the Bird Control Unit to provide both visual and digitally acquired information to ATC on potentially hazardous bird activity. This capability comes into its own during the winter months as we are now able to detect and track skeins of geese flying over, or near the airfield, during darkness, reducing the risk to both the Poseidon and Typhoon and, in the future, the E7. The RCO and Robin Radar Systems were pivotal in helping to deliver the capability in such a demanding timeframe. Numerous issues were overcome through effective collaborative working and the can-do approach of the RCO, Robin Radar and the LOS Team. Robin Radar is currently upgrading the radar with a new module to detect and track drones and we are looking forward to exploiting this additional capability."

Royal Canadian Air Force
Winter Operations

By Col (Retd) Steve Charpentier and Major Jill Sicard, DFS RCAF

Imagine yourself in this scenario; your helicopter crew is travelling through the far north and are forced to land in the Arctic because of the rapidly degrading visibility. The temperature drops below -10°C and you must spend the night in the cockpit waiting for the weather to clear up. During the night, you experience a visit from a not so friendly polar bear and have to climb on top of your helicopter, throwing things at the bear in hopes it will go away! This is a true story and, fortunately, the bear decided to disappear, but it provides us with a picture of what an unexpected situation could look like in our vast country during cold weather operations. Preparing for winter in the RCAF happens in a variety of ways; if you live in the north, winter has already started (did it ever end?); central Canada basically skips Autumn temperatures and go from +30°C to -30°C in the span of a week - followed by the coasts who have two completely unique set of rules for winter operations.

Meteorological changes start happening at different rates around Canada and with climate change it's never consistent but here are a few things that the RCAF looks out for when it comes to cold weather phenomena. Firstly, make sure you always have the current weather and suitable gear. Things can change so quickly and options to land or divert may be quite limited for IFR aircraft or even unavailable for VFR aircraft.

Every year when Autumn arrives, we re-educate aircrew and ground crew on cold weather procedures. They receive various briefings and lectures such as wind-chill factor, low visibility, icing, first aid, and more. We also offer advance arctic survival training, and every aircrew must learn the basic survival skills. The training and briefings are critical for aircrew that are exposed to the elements while transiting over our massive unfriendly frozen lakes and lands and for ground crew deployed in a harsh environment supporting air operations.

Each Squadron develops their own 'Cold Weather Brief' package to prepare everyone for the diverse weather conditions they may encounter based on their Squadron location and aircraft type. There are normally four parts to those briefings: Weather phenomena, aircraft-specific limitations, survival skills and equipment which lead to medical issues and cold injuries. We will cover the basics of each section. During winter Ops the conditions experienced include: icing of varying types, turbulence, ice fog, and rapidly moving blizzards.

Icing

Icing is something I think everyone has experienced during the winter months no matter where you are located. Be aware that, when it comes to icing conditions, it can change your normal expectations with regard to aircraft weight and it also disrupts the airflow, creating drag and decreasing lift.
Icing is classified in four different stages of intensity: trace, light, moderate and severe. Trace is when it is first noticed and does not pose hazards if occurring for less than 60 minutes. Light icing conditions are when accumulation begins. Moderate icing happens when accumulation is greater and can be hazardous if you do not use de-icing equipment. Once the rate of accumulation reaches a point that the use of de-icing equipment is no longer effective, it is considered severe. If you are airborne when this happens, you should divert immediately! Such a flight in a Sea King happened where the crew were flying at high altitude and started experiencing icing and, before they had a chance to turn around, the aircraft started buffeting indicating an imminent stall condition, luckily they were able to descend quickly and the icing started to melt—remaining vigilant and being able to act swiftly is key.

Turbulence

Normally cold weather brings nice stable air, especially over central and northern Canada; however, there is still plenty of terrain that will generate turbulence. For example, when the sun is shining—particularly for prairie type locations, thermal turbulence occurs. This is when the surface heats up from the sun and then the warm air rises. Uneven surface heating and the cooling of warmed air cause updrafts and downdraughts. Mechanical turbulence is caused by wind shear, both horizontal and vertical. The most common causes are pressure gradient, terrain, and frontal zones. Winds are lighter in areas of high pressure and are stronger in low-pressure systems. Mechanical turbulence is increased around mountains and varying terrain heights where wind is funnelled through passages. Like icing, there is light, moderate, severe and

Wg Cdr Spry Comment:

The RCAF are undoubtedly the subject matter experts when it comes to Winter Operations. Our Canadian safety colleagues put this article together largely for a Canadian audience, but the majority of advice applies to all forces, especially if travelling overseas to similar climates. At the same time, cold injury risk applies equally to UK personnel. Take what you can from this sage advice..

extreme turbulence. One such incident occurred not too long ago with a CP140 flight in December on the west coast where the turbulence was so fierce, it shook the head sets from the strapped-in pilots and one of the crew members in the back was lifted off the ground and violently tossed, resulting in a broken arm.

Fog

Fog can be tricky because during the winter in Canada only certain areas develop it regularly, so it is an important one to know if you are flying into one of those locations. There are several different types of fog but, for Winter, you need to be aware of freezing fog, which is like freezing rain - supercooled water droplets that remain in a liquid state until encountering a freezing surface. When that occurs, the fog freezes, thus the name. Ice fog normally occurs in very cold temperatures and is composed of tiny ice crystals that are suspended in the air. Finally, advection fog, which is common along coastal areas, forms when moist air moves over colder ground or water. It can persist for days if there is little wind to disperse it. Freezing fog or sometimes freezing mist can also happen in the Springtime, recalling another story where the crew was flying a chopper along the Mackenzie River at low level in light mist or haze when suddenly the windscreen turned into an opaque Popsicle forcing them to stop and turn around using only lateral visibility.

Blizzards

Rapidly moving blizzards can cause a lot of problems in a short amount of time which can include icing, turbulence and fog along with whiteout or poor visibility. Most helicopters cannot revert to IFR flying because of icing conditions. IFR aircraft may find their airport suddenly unavailable and will need to revert to their alternate. Therefore, it is imperative to keep alert for changing surroundings and be prepared with a backup plan if required. Especially under NVGs (Night Vision Goggles), it can be challenging to detect changes—such is the case in this next story of getting caught at night under NVGs in a rapidly moving blizzard north of Québec City. The pilot was forced to land on a frozen lake and revert to survival mode with the limited survival equipment available on board of a Kiowa helicopter. Although only 50NM north of Québec, they had no means of direct communication with the Squadron. They attempted to launch a rescue team on snowmobile but had to turn around because of the intense blizzard. The following morning the weather cleared up and thankfully everyone was OK, however without the survival tent and some decent gear, the story could have been tragic.
Aircraft Specific Limitations

Obviously, we cannot go through every limitation and requirement for each aircraft but there are some universal recommendations that are important to know. Each aircraft has a temperature operation limitation, a de-icing protocol and fuel additive requirement. Furthermore, each aircraft has their own little quirks or possible equipment errors in cold temperatures, make sure you know what those are and what you can expect flying in colder temps, for example, a fouled hoist, or pitot static system. Below is a list of reminders.

- Hangar space storage avoids most winter pre-flight problems.
- Additional personnel may be required depending on the mission i.e. taking shifts to avoid cold injuries, preparation takes longer, etc.
- Maintenance may have issues as well in cold weather e.g. APU starts.
- Whiteout is very common on snow-covered ground during landing/taking off.
- Be sure to check the freedom of movement in controls while on the ground.
- Battery removal may be required if temperatures are sub-zero.
- For helicopters, use caution with rotor brake on ice and oleos may compress in cold weather.
- For fixed-wing aircraft, de-icing and anti-icing requirements add both extra steps and time, be aware of flap positions while parked, taxiing and after landing.

Survival Skills and Equipment

During the walk around, ensure you are not getting cold, if you are, you are underdressed, make sure your survival kit is serviceable. Be knowledgeable about what is inside the kit, and how to use it. There is a tendency to under-dress in the aircraft for most people including passengers and aircrew. It is nice and toasty in the aircraft with the heat on until you are forced to land in the middle of nowhere. Or, your fixed-wing aircraft must complete a forced or crash landing in Arctic-like conditions. It is important to have your gear readily available for the slim chance you might need it.

The disaster of BOXTOP 22 in 1991 sums up exactly what we are trying to convey when it comes to survival, equipment and overall, the importance of winter operational knowledge. In October of that year, a Hercules crashed after losing sight of the runway (CFIT) in the high arctic. Four passengers died because of injuries suffered in the crash. Thirty-two hours passed before rescue crews were able to arrive at the site. The aircraft commander succumbed to hypothermia before rescue personnel could arrive on scene. The survivors, some soaked in diesel fuel, endured high winds and temperatures between -20°C and -30°C. Many sheltered in the tail section of the downed aircraft but others were more exposed to the elements, all of them suffered from hypothermia. Repeated attempts by the surviving crew and passengers of BOXTOP 22 to recover all possible clothing and emergency supplies were ineffective due to the combination of crash damage, poor weather and arctic winter darkness i.e. poor visibility. The standard issue kit bag and the designated survival kit bags were almost identical in appearance, particularly in the dark. The crew made several forage trips through the wreckage in search of survival gear or supplies, but the majority of the equipment found was from the sea survival equipment and several personal kit bags which proved to be of little value.

In some cases, you may not be able to readily access your luggage because of injuries. If you are flying in and out of cold weather wear your gear or have them right beside you.

Medical Issues and Cold Injuries

If you are a ground crew working outside, you should know how to recognize the onset of cold injuries to both yourself and your partners. Use the buddy check system. Take frequent breaks to warm up, keep hydrated and dress properly. When asked to deploy somewhere consider the worst and make sure you are kitted appropriately for it. Injury caused by exposure to cold can lead to permanent injury, loss of body parts and even death. Hypothermia, frost bite, chilblains and immersion foot are just a few.

Our enemies in this cold environment are water and wind. Water on the skin causes you to feel colder and lose heat faster, wet skin freezes faster than dry skin. Wet hands and feet can even have damage at above freezing levels. Cold water immersion cools the body 25 times faster than cold air. So, the takeaway is to keep dry if at all possible!

When the wind blows, it takes away that boundary layer which is a thin layer of warmth created by our skin, it also takes more energy to re-create that boundary layer, so each time the wind removes it, we get colder trying to re-create it. This is why wearing appropriate layering is very important as well as seeking shelter from the elements. Develop a plan for cold weather work, proper clothing is the single most important resource to keep you warm. A water wicking material base layer followed by loose-fitting layers will trap heat inside.

If we are exposed to the cold for an extended period, injuries such as frost bite, Hypothermia and carbon monoxide poisoning can occur. Hypothermia and frost bite are the most common cold weather injuries, especially in prolonged exposure. The symptoms for hypothermia are shivering, lack of coordination, impaired judgment, confusion and slurred speech. Frostbite causes redness in the skin followed by numbness, after this, the colour changes to a waxy-looking white that is hard to the touch. Finally, ending in deep frostbite which is blueish (muscles in that area will not work properly). In all cases of the above injury, you want to prevent further injury immediately by keeping the area dry and preventing more 'cold exposure'. Warm up gradually, especially important for frostbite.

Carbon monoxide poisoning can happen with heaters and heat sources, for example, trying to warm up inside an enclosed space like a tent or aircraft and can occur without the victim even knowing. Symptoms are tiredness, headache, yawning, dizziness, nausea, chest pain and confusion, followed by unconsciousness, causing death. Always ensure adequate ventilation, ensure heaters are regularly serviced.

Although we could talk about winter operations for an eternity, we have surmised some very important aspects of winter prep for Canadians and flight safety operations. Every year, we are reminded of the importance to be prepared and we hear so many stories that provide a Lessons Learned aspect that brings that importance so much closer to home in order to avoid the thought of 'that will never happen to me'. In such a diverse and challenging geographical nation, we in the RCAF require those reminders to remain vigilant and safe. When it comes to winter, always expect the worst-case scenario and be prepared to survive it.

UK Airspace Classes Explained

By Sqn Ldr Stu 'Ozzy' Osborne, RAF Safety Centre

References: UK AIP - ENR 1.4, RA2307, AP3456, CAA website

It can be difficult and often daunting to fully understand the airspace within the UK, even when we control or fly around it on a daily basis. This article aims to debunk some of the intricacies and help explain what the rules are for us in the military. Although a brief summary of the division of airspace is included here, the UK Aeronautical Information Package (UKAIP) and RA2307 is the authoritative document on this subject and should be consulted for further details.

The International Civil Aviation Organization (ICAO) has divided the world's airspace into Flight Information Regions (FIRs). A FIR is airspace of defined dimensions, within which flight information and alerting services are provided.

Flight Information Service (FIS). An FIS supplies advice and information for the safe and efficient conduct of flights.

Alerting Service. An alerting service notifies the appropriate organizations regarding aircraft in need of assistance.

An FIR often coincides laterally with national boundaries; larger countries may have several FIRs within their national airspace. In a maritime, or mainly maritime region, an FIR may be known as an Oceanic FIR. It extends vertically from ground level to a specified upper limit. Some nations provide an Upper Flight Information Region (UIR) in upper airspace. Each FIR will have an associated Flight Information Centre (FIC) or Area Control Centre (ACC). UK Airspace is divided into three FIRs; London, Scottish and Shanwick Oceanics (covers a region of airspace totalling 700,000 square miles over the Northeast Atlantic). The London and Scottish FIRs/UIRs are divided vertically into the following bands:

UIR. Upper Airspace (UAS) from FL245 to unlimited.

FIR. Lower Airspace (LAS) from surface level to below FL245.

Airspace within an FIR is broadly defined as either controlled or uncontrolled airspace. Controlled airspace (CAS) is a generic term and is used to describe airspace which is

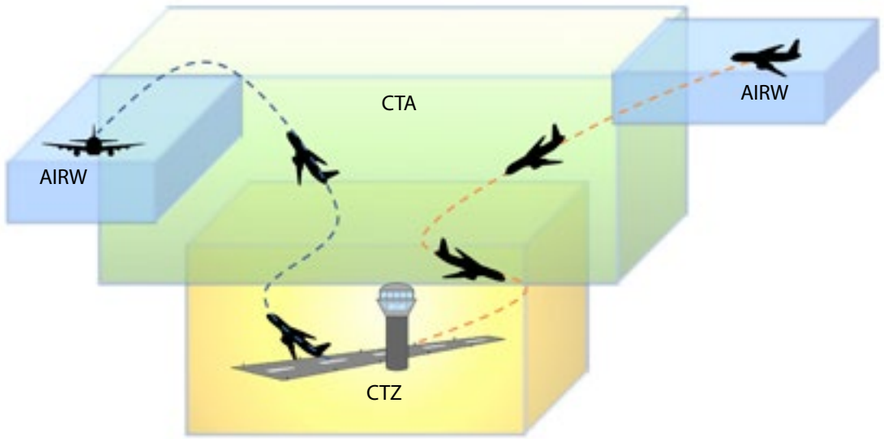


Fig 1. Illustrates the relationship between CTZs, CTAs and Airways

notified as such in the UK AIP; within this airspace civil pilots are required to comply with ATC and other regulations forming part of the UK Air Navigation Order (ANO) and Rules of the Air Regulations. In essence CAS comprises different types of control zones and control areas. These areas are assigned one of the ICAO Airspace Classifications A to E. Classes F and G are reserved for uncontrolled airspace. The UK airspace uses five of the 7 classes; A, C, D, E and G. CAS is divided into two main functional types; control zones and control areas, and for the purposes of this article, airways are also considered separately:

Control Zones (CTZ). A CTZ, in some cases known as a controlled traffic region (CTR), is established around an airfield to protect all aircraft flying within it. A CTZ extends vertically from the surface of the earth to a specified upper limit.

Control Areas (CTA). A (CTA) is usually established to cover approaches and departures from a major airport. Many of the control areas over land are classified as terminal control areas (generically abbreviated to TCA or in specific cases TMA). In addition, vast control areas exist over ocean regions. These are called oceanic control areas (OCAs). Control areas extend vertically between promulgated lower and upper limits.

Airways. Airways are corridors of airspace connecting the CTAs and link up with airways from other countries too and are normally 10nm wide and extend vertically between promulgated lower and upper limits.

CAS is airspace of defined dimensions within which air traffic control service (ATS) is provided to Instrument Flight Rules (IFR) flights and to Visual Flight Rules (VFR) flights in accordance with the airspace classification.

Aerodrome Traffic Zone (ATZ): An ATZ is established around an aerodrome, where aircraft shall not fly, take-off or land within the ATZ of an aerodrome unless the commander of that aircraft has obtained the permission of the air traffic control unit at the aerodrome or – where there is no air traffic control unit – has obtained from the aerodrome flight information unit at the aerodrome, information to enable the flight within the zone to be conducted with safety or – where there is no air traffic control unit nor aerodrome flight information service unit – has obtained information from the air/ground radio station at that aerodrome to enable the flight to be conducted safely.

Note, an ATZ conforms to the Class of Airspace in which it is situated thus, for example, in Class D Airspace the requirements of Class D will apply in addition.

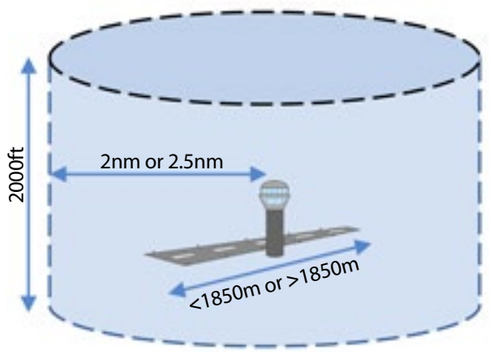


Fig. 2. Dimensions of an ATZ

Military Aerodrome Traffic Zones (MATZ): The purpose of a MATZ is to provide a volume of airspace within which increased protection may be given to aircraft in the critical stages of circuit, approach and climb-out.

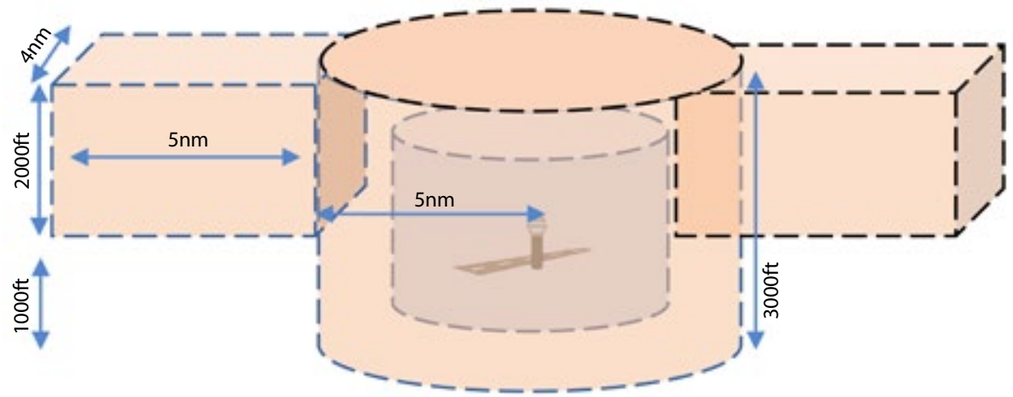


Fig. 3. Dimensions of a MATZ

Important to remember is that the recognition of a MATZ by civil pilots is not mandatory; however, they are encouraged to request a MATZ crossing. Instructions to Military pilots within a MATZ are mandatory. Civil pilots must comply with the provisions of the ATZ. Additionally, a MATZ, like an ATZ, conforms to the class of airspace in which it is situated and most MATZ sit within uncontrolled Class G airspace.

Under ICAO, CAS in the UK is defined as:

Class A. IFR flights only are permitted. All flights are provided with an air traffic control service and are separated from each other. Class A airspace comprises all Control Areas (Airways) below FL195 with some exceptions listed in the UKAIP. It is the most strictly regulated airspace where pilots must comply with ATC instructions at all times.

Class C. IFR and VFR flights are permitted, all flights are provided with air traffic control service and IFR flights are separated from other IFR flights and from VFR flights. VFR flights are separated from IFR flights and receive traffic information in respect of other VFR flights. Within the London and Scottish FIR/UIRs, Class C airspace extends from FL195 to FL660 which includes the Hebrides Upper Control Area (HUTA) and a network of domestic and international routes for use by General Aviation Traffic (GAT).

Class D. IFR and VFR flights are permitted, and all flights are provided with an air traffic control service, IFR flights are separated from other IFR flights and receive traffic information in respect of VFR flights, VFR flights receive traffic information in respect of all other flights. Class D CAS comprises CTAs and/or CTRs surrounding notified aerodromes, including some military aerodromes, together with part of the Scottish TMA and sections of some airways. There is an interesting case study within the Airprox section of this issue (2021228) between a VFR Class D transit through RAF Brize Norton airspace and a Voyager; this highlights the risks between IFR vs VFR traffic mix in Class D.

Class E. IFR and VFR flights are permitted. IFR flights are provided with an air traffic control service and are separated from other IFR flights. All flights receive traffic information as far as is practical. Class E shall not be used for control zones. Class E CAS comprises the parts of the Scottish TMA below 6000 ft and parts of some airways.

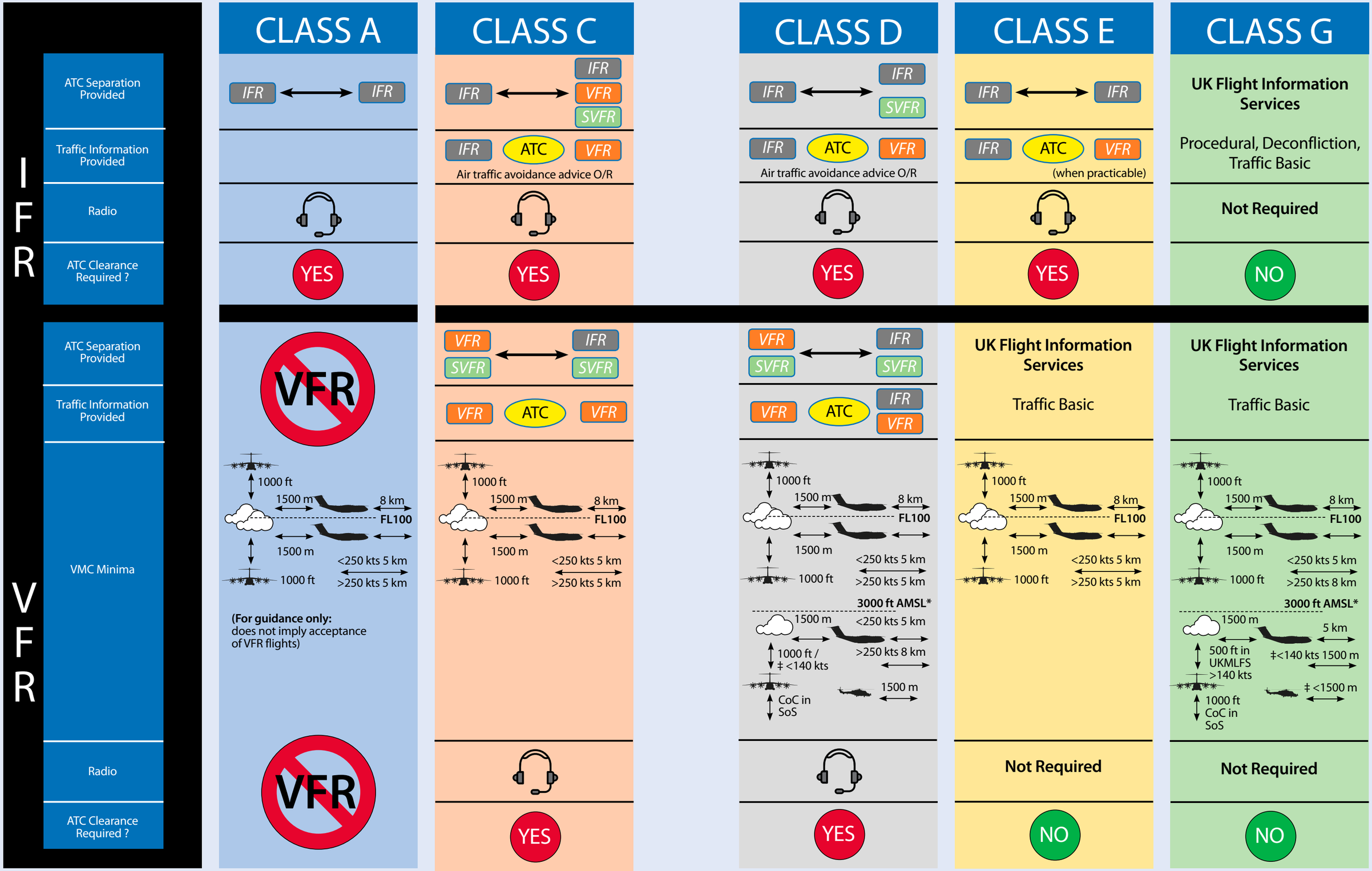
Under ICAO, uncontrolled airspace in the UK is defined as: Class G. IFR and VFR flights are permitted and receive a flight information service if requested. All UK airspace, including that above FL 660, not included in Classes A to F is designated Class G airspace.

Flights by military pilots should be conducted either under IFR, VFR or Special Visual Flight Rules (SVFR) as appropriate. Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC) refer to the weather conditions encountered during flight. These terms are used to denote actual weather conditions, as distinct from the flight rules under which the flight is being conducted. VMC exist when the weather permits flight iaw the VFR; IMC exist when weather conditions are below the minima for VFR flight. Within the UK, under VFR, Pilots should maintain safe separation from other traffic. To operate under VFR, the extant environmental conditions should meet the VMC minima specified in RA2307.

Fig. 4. Is designed to be a pullout poster for you and incorporates all of the information within the UKAIP and RA2307 in a ready digestible diagram. As already caveated, the UKAIP and RA2307 are the master documents and will have the most up to date information.

Fig 4. DIAGRAM MODIFIED FOR MILITARY AIRCREW ONLY – NOT TO BE USED BY GA PILOTS.

Source diagram CIVIL AVIATION AUTHORITY - Amended with permission.



O/R - On request, CoC - Clear of Cloud, SoS - Sight of Surface

* - Or 1000 ft above terrain, whichever is the higher

‡ - To give adequate opportunity to observe other traffic or any obstacles in time to avoid collision

The Benefit of Organisational Knowledge Management

By Flt Lt Alex Smales, RAF Safety Centre

Photo Ref – olya-kobruseva Pexels.com 5428833

As the RAF Safety Centre Air Safety Assurance Team (ASAT), we see lots of examples of things we do well, and others that we do not as well. One area that we see often is a lack of good corporate memory. For example, repetition of the same issues again and again, or being unable to understand why decisions were made, which is particularly important when safety is involved. I've seen this myself in previous roles, as we strive to improve processes but forget the reason why things were done like that in the first place, only causing confusion and creating more work. This is made all the harder as much of our activity supports safety, meaning we need the rationale behind decisions to fully understand the impacts they had.

Why does this happen so often? From experience I think the answer is 2-fold, firstly as an organisation the speed at which people changeover is often much greater than in most companies. As an example, I have friends who can rely on colleagues that have spent most of their professional life at the same company, so they can be turned to for explanations on things that happened 10+ years ago. For us, we usually don't have that luxury and the lessons we learn can be quickly forgotten. The easiest way to combat this is through strong knowledge retention, my second point. Our knowledge retention is often weak with tools to help retain information underutilised. While decisions we make now may be straight forward to us, if not properly recorded, they may not be for our successors.

We are unlikely to change the way postings work within the military just for the sake of better corporate memory. Therefore, the best chance we have to improve our corporate memory is through better use of knowledge retention tools, some of which I will cover in this article.

Photo Ref – Andrea Piacquadio - pexels.com 3769138

Before going further it's important to note that we have a regulatory requirement to formally maintain safety documentation. However, this can be difficult to manage and even more difficult to locate as time goes by.

The first thing we, as a team, always do when working up to an audit is review SharePoint pages, some are good and easy to navigate, others are not. Well-structured and easy to navigate document libraries act almost like maps and help better manage the storing of items for use, not only now, but also in the future. Often, while teams may acknowledge their document storage structure isn't great, we hear the rational that everyone in the team understands the set up so it's easier for things to just stay as they are. However, just because this may be so doesn't mean it's going to be obvious to others now and in the future and doesn't make for a good long-term solution. From a safety point of view the best structures we regularly see are based around the 4 pillars or 16 auditable facets (detailed in RA 1200) or from a general point of view for all documentation an A1-9 format works well.

Not everything we do needs to be formally documented and recorded. But, for day-to-day informal working and note taking OneNote is a great tool to make notes and work collaboratively. OneNote isn't intended to be used as an archive and documentation we are legally required to maintain shouldn't be stored using OneNote, such as meeting minutes and Records of Decisions. But for less formal uses we've seen OneNote used successfully in many ways to support collaborative work while allowing unofficial notes to be kept for future reference. In fact, we as a team use OneNote to support much of our day-to-day activity, such as sharing notes of reviews, recording interview notes and linking to key documents to support the production of reports. It's even possible to upload and save documents to OneNote, such as draft presentations, so that they can be kept with relevant notes for joint working.

Hand over, take over (HOTO) notes are also a key tool that we have for providing corporate memory, particularly for those in roles intimately involved with safety, and for organisations with a high turnover, such as our overseas locations. Therefore, it's key to ensure that as much useful information is contained within HOTO notes as possible, including the rationale behind things relating to safety that have ongoing implications. Formal HOTO notes should be recorded and archived with the most common means being a word document and storing in a designated SharePoint folder to ensure they can easily be searched for, and a record built up over time. OneNote is also a tool we have seen and recommend for making the production of HOTO notes easier as previous notes can be copied and updated continually during someone's time in role things change before being formalised just before handover as opposed to being rushed towards the end.

Good knowledge retention is essential for the way we do business and supporting safety in the RAF, especially as we can't grow corporate memory in the way many other organisations can. However, looking at the way we do business with an eye on the future can help elevate some of the problems we experience from previous poor retention.

Within this article I've covered just a few useful tips and tools the ASAT have come across during our audit activity. Please feel free to reach out and contact one of the team if you'd like further help with knowledge retention. As part of our work, the ASAT maintain a Good Practice Portal which can be found via the RAF SC SharePoint Communications page. Here we record Good Practices observed during our regular assurance visits for the benefit of others.

STEP Training

By Peter Hibbert, Baines Simmons

CoAST Training Centre, MOD Shrivenham (Photo: MAA –A. Johnson and CoAST)

Are You in Step?
In his report into the 2006 Nimrod accident, The Rt Hon Lord Justice Charles Haddon-Cave praised the initiative of two RAF officers for instigating a Human Factors Maintenance Error Management System called HF M(EMS) within RAF engineering. The report also referenced how our company, Baines Simmons, that had proven expertise in project-managing error management in the civil sphere, had also been engaged to assist with the venture. Over time HF (M)MEMS developed into RAF AEMS (Aviation Error Management System), it then became a tri-service initiative evolving through DAEMS (Defence Aviation Error Management System), DAEMS II and in its current form it is the MOD's Safety Training for Error Prevention (STEP) programme, which Baines Simmons continues to manage on behalf of the MAA.

What is STEP?
STEP is a technical support initiative designed to facilitate the establishment of an effective Aviation Safety Management System (ASMS), by increasing competence and awareness of Air Safety, or to put it simply as someone at Abbey Wood once said to the author, improve the 'Safety SQEPicity' of both the organisation and the individuals within it. (SQEP: Suitably Qualified and Experienced Personnel).

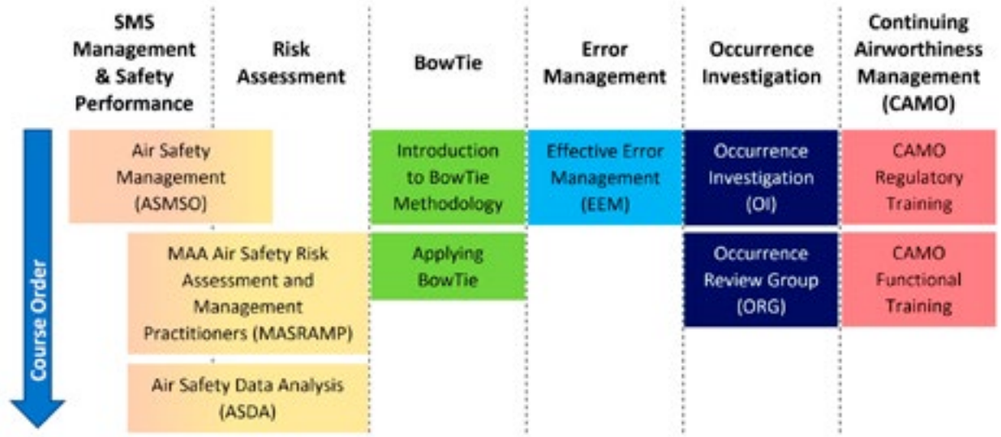
Training Courses
STEP training consists of a suite of courses that can be standalone or attended as part of a competence pathway - although this does mean that there is duplication of topics on some of the courses, albeit pitched at different levels. This means that if you are attending multiple STEP courses be mindful that whilst you may have previously covered part of the subject, others may not as they may be doing the course as a standalone for their role.

As some of the courses build subject knowledge this also means that if you are doing more than one there is an ideal order to complete them so wherever possible look at the table on the next page and work with your course sponsor / STEP PoC to complete the courses in the vertical order shown. All courses are delivered at the MAA Centre of Aviation Safety Training (CoAST) at The Defence Academy, Shrivenham, locally on unit or virtually via Microsoft TEAMS.

ASMSO – Air Safety Management System Overview.
This 2-day course provides a high-level view of an Aviation Safety Management System. It covers the reasons for, and benefits of, effective ASMS implementation, the 16 functional elements of an ASMS, their interactions and how an effective ASMS is needed to support an Air System Safety Case (ASSC).

MASRAMP – MAA Air Safety Risk Assessment & Management Practitioners Course. Examining RA 1210 - ownership and management of operating risk (risk to life), this 3-day course enables delegates to understand and apply basic Safety Risk Management (SRM) techniques and provides a better understanding of the MAA's expectations with respect to the practical implementation of risk management regulation. (Note: As the course is focused on individuals new to role, the training is likely to be unsuitable for experts seeking advanced instruction).

ASDA – Air Safety Data Analysis. The Air Safety Data Analysis (ASDA) course teaches the 'building-block' principles of data analysis using ASIMS data and Microsoft Excel. It is a practical hands-on 3-day course, aimed at Practitioners in a



MAA graphic, redrawn by Baines Simmons.

Safety role, who are required to understand and/or compile Air Safety reporting, and draw conclusions linking back into Safety Risk Management. It also discusses using available data and relating it back to Continuous Improvement and Air System Safety Cases. (Note: As the course is currently focused on individuals new to role, the training is likely to be unsuitable for experts seeking advanced instruction).

BowTie – Introduction to BowTie methodology.
The power behind the BowTie methodology lies in its effective application and this 3-day course, endorsed by CGE Risk Management Solutions (developers of BowTie software), is aimed at helping delegates to effectively manipulate and produce your own BowTies to communicate risk to the right audience.

BowTie – Applying BowTie. The power behind the BowTie methodology lies in its effective application and this 3-day course, endorsed by CGE Risk Management Solutions (developers of BowTie software), is aimed at helping delegates to effectively manipulate and produce your own BowTies to communicate risk to the right audience.

EEM – Effective Error Management. This 3-day course provides an overview of the key components of an Error Management System and how it supports an Engaged Air Safety Culture. From reporting through to investigations, Review Groups and measuring the performance of the system, all elements are considered, and, importantly how the maximum benefits of each can be delivered. By exploring the field of Human Performance, the course examines the effective use of the Error management 'tool kit' to facilitate consistent and effective human orientated output and enhance operational performance.

OI – Occurrence Investigator's course. Conducting a successful 'Human in the System' investigation can be a complex and demanding undertaking. Exploring why errors

have occurred or outcomes were not as expected, while maintaining a non-judgemental, Just Culture based approach requires careful consideration and planning. The 4-day Occurrence Investigators course is a practical skills-focussed course which gives the participants the complete skill set and techniques to confidently conduct effective Occurrence Investigations and present their findings. Delegates are given the opportunity to develop their investigative interview skills using the latest thinking in cognitive interviewing techniques, they also explore investigation planning, preparation, and data analysis and consider the development of effective, efficient, and sustainable recommendations.

ORG – Occurrence Review Group. The 2-day Occurrence Review Group (ORG) course offers the candidates the chance to explore the learning opportunities that often exist when things do not go as planned. The outputs of the ORG are a key component of an effective Error Management System, and in addition to assuring the Duty Holder that the investigation has delivered against its terms of reference, it also plays a vital role in the operationalisation and delivery of Just Culture. The training covers the full ORG process and allows the candidates to conduct an ORG on a real-world event. The course is highly interactive and delivers a complete range of practical skills, competence, and confidence to enable ORG members to conduct effective reviews of investigations that support a Just Culture.

CAMO – Continuing Airworthiness Management Organisation – Regulatory Training. This 1-day course aims to provide delegates with an understanding of the UK Defence Continuing Airworthiness Management Organisation. It introduces MRP RA 4900 series regulation and focuses on explaining the Defence CAMO construct and philosophy, identifying the key responsibilities, and describing the relationship between the CAMO and other stakeholders. The course is aimed at all CAMO staff, front line command staff and those that work in support including DT personnel. CAMO - Continuing Airworthiness Management Organisation – Functional Training. This 3-day course will introduce and examine the key tasks expected of a Defence CAMO from the perspective of how to achieve greater effectiveness. It focuses on enabling delegates to develop or discover principles, techniques and skills that have traditionally been acquired from experience in the field, learning from trial and error and more experienced peers. It aims to reduce the time it takes to develop an individual to be competent and effective in CAMO skills.

Preparing for a STEP Course
The most important thing to recognise before attending a course is that no matter what your rank, or experience level is, everyone has something to contribute. The courses encourage open communication from every participant so please join in the discussions enthusiastically.

Some courses have pre-reading requirements, these are not extensive and completing them allows you to get the most out of the course. Some courses will have small homework tasks set, again these aren't overly time consuming and completing them allows for more to be covered during the classroom sessions, so be prepared for a little work during the evenings.

A Virtual Course
Virtual training was introduced to STEP to allow training to continue during the Covid lockdowns, and it will remain a course delivery option going forward.

The Baines Simmons facilitators have been informed by the MAA that the JPA course competency will not be awarded to anyone that doesn't engage, so test your IT set up beforehand and ensure you have your camera on for the course. If your MOD IT doesn't have a working camera try and source IT that does, or maybe even log onto the session using a personal laptop, although no phones or tablets please, they simply don't have large enough screens.

It is appreciated that when attending virtual sessions distractions can occur, the facilitators are used to people walking past, the dog jumping up, kids running in or even the rabbit trying to chew through the laptop power supply. However, please don't arrange meetings, or other engagements during the session. It can also be tempting to get on with your outstanding administration and check your e-mails, please don't. Put simply, don't treat a virtual classroom any different from a physical one.

Specialist Technical Support (STS)
STEP also allows Baines Simmons to offer specialist support in areas such as Risk Management / Duty holder upskilling and 2nd party assurance activity. 16 CAMO improvement modules have also been developed to target specific pain points within a CAMO, provide a diagnosis of current processes, identify areas for improvement and provide a realistic action plan to deliver the desired future state.

It is important to note that these 'CAMO' modules are not training courses, as they focus on the CAMO, rather than individual, performance. The modules cover all CAMO tasks and are flexible enough to be able to be shaped to address what an individual CAMO requires; they are then run in a bespoke combination depending on the CAMO's needs. The Baines Simmons team are experts in their fields, many are ex-military and enjoy the opportunity to give back. Whether facilitating a training course, providing STS or as part of the administrative support team, they want you to get the most out of the engagement, so please feel free to talk to them and attend STEP activities being prepared to participate and learn.

If you wish to know more about STEP contact your local STEP PoC or e-mail: STEPsupport@Bainessimmons.com.

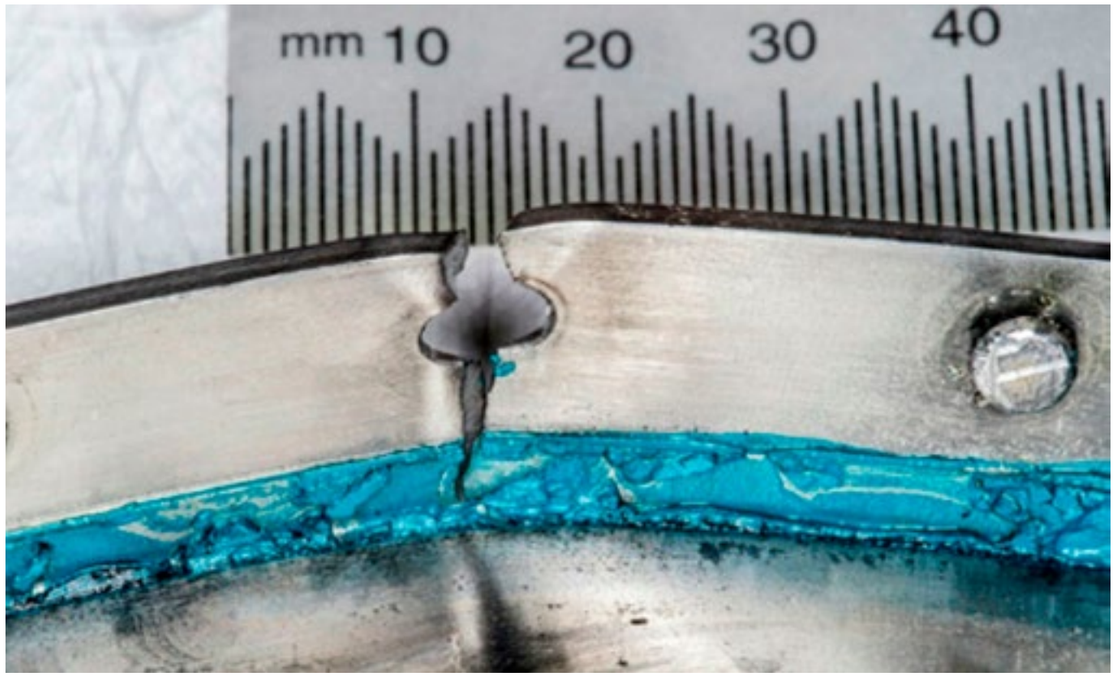
BAINES SIMMONS
SAFETY SERVICES

Keven Baines and Bob Simmons, both ex RAF NCO engineers, licenced aircraft technicians and CAA airworthiness surveyors established Baines Simmons over 20 years ago and Bob Simmons remains in the business as a Director today. As well as delivering aviation safety training, Baines Simmons also provides technical support in all areas of aviation safety, regulation, and fatigue risk management. As part of their outsourced services the company provides wildlife hazard management services for many airfields, including 15 UK Military airfields. Baines Simmons also manages large elements of the world's largest private aircraft registry on behalf of the regulating government body, this involves conducting aircraft surveys and approving maintenance programmes.

It is from this position of expertise, across many facets of aviation, that the company looks to add value to military aviation through the MOD STEP programme.

The Importance of Conducting Visual Checks Properly

By the RAF Safety Centre



Now you might think that an article telling you about the importance of visual inspections is like someone teaching you how to suck eggs? Well yes, it might. But, if so, why do people still manage to complete a visual inspection and miss something important? 'Human nature' we hear you say, 'distraction', 'workload' to name but a few. Yes, the visual check suffers as a result of Human Factors, but we should still persevere to deal with it. In the same way that our sensory system is acutely alerted to the consequences of helping ourselves to a free toffee from the shop 'pick'n'mix' we want our people to be acutely alert to the consequences of paying lip service to a visual check. Consequently, the Safety Centre Awards system is full of 'Well Dones' where our people have conducted a visual inspection and noticed something wrong.

Visual inspections are one of the oldest and most trusted ways to evaluate the condition of an asset as part of an overall maintenance process. It is also the most trusted way to check that your personal equipment is correctly configured.

The goal of a visual inspection is to find anything that might be wrong with the asset which could require maintenance. A visual inspection is completed using only the naked eye. This kind of inspection does not necessarily require any special equipment, but it does require special training so that the inspector knows what to look for as they visually review the asset. For aircraft, inspections provide early detection of defects, manufacturing errors, or fatigue. They also help aircraft maintenance teams obtain information about the condition of a defective component or unit.

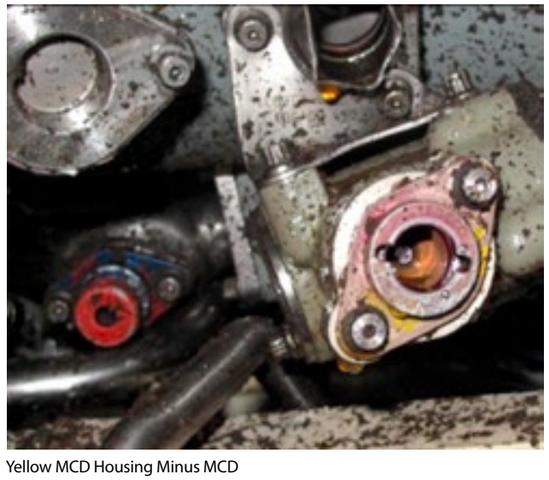
Error rates for visual inspection can be as low as 3-10% under the best conditions, to as high as 20-30% in suboptimal conditions. Striving for those low error rates requires skilled, experienced, well-trained inspectors. This also demands a comfortable environment including good lighting, frequent breaks, and low-stress levels. Aircraft Hangar floors and lighting should be designed to create just this kind of optimal visual environment.

In a recent Hawk aircraft accident, where the crew ejected safely, the investigators found that an oil leak occurred because of an incorrectly fitted Magnetic Chip Detector (MCD) in the aircraft engine. This chip had been replaced the night before and witnesses all corroborated that the chip was fitted, so the conclusion by the Panel was 'incorrect fitting of the Yellow MCD'. Testing demonstrated that once the oil system pressurised, an incorrectly fitted MCD would be ejected. The oil would leak from the MCD housing until the engine was starved of oil, at which point it would suffer catastrophic mechanical failure. The oil leak would not be noticeable on the ground with all panels closed.

The importance is quite obvious when inspecting something like a parachute or a rifle or a life jacket, and less so when inspecting something like an aircraft panel.

But, even parachutes, life jackets and rifles suffer from poor visual inspections and proceed with some serious faults as a result. Pilots and aircrew have to conduct visual checks all the time. Walk round checks and instrument scanning are two examples of where a good spot can get you out of trouble. Air Loadmasters will conduct a visual gross error check to make sure the centre of gravity calculated in the books makes sense – only experience can tell. Cracks, leaks, gaps, missing components, incorrect fittings are all picked up visually and can lead to catastrophic consequences if not. So, the message is simple:

"Conduct Your Visual Checks Properly"



Yellow MCD Housing Minus MCD

RAF Halton MCASD
Military-Civil Air Safety Day: Why and How

By Flt Lt Sarah Hindley, Station Flight Safety Officer

A highly successful Military-Civil Air Safety Day (MCASD) was held at RAF Halton Airfield on 7 Jul 22; it was one of the first such events to be held following the easing of restrictions imposed by COVID and had been an aim from our Flight Safety Meetings since 2019 to engage with General Aviation (GA) pilots. The desire to hold the event became more urgent when, following the COVID lockdowns, we had 12 Air Traffic Zone (ATZ) infringements (of which 5 were Airproxes) in a 14-month period. To put this into perspective, RAF Halton had averaged around two DASORs/year in the previous 4 years. As the Station Flight Safety Officer this was concerning; I had liaised with local flying clubs and airfields, but frequently the infringements were by aircraft from much further afield. So, we needed to do something that offered engagement with GA pilots from airfields around the UK. A MCASD provided this opportunity whilst also enabling us to give an overview of Halton air operations to attendees along with a healthy dose of Flight Safety information.

My first step was to approach the General Aviation Safety Council (GASCo), an organisation dedicated to saving lives in GA through education. Their support and advice proved invaluable as they have extensive experience of leading Safety Evenings and Events. It was agreed that we had the capacity to host around 100 visitors, and GASCo advised taking 'expressions of interest' over a limited time rather than using a 'first come, first served' basis, as this would give us a reserve list should people be unable to attend after accepting a place. The GASCo system is set up to permit aircraft details and/or vehicle details to be submitted, along with applicant and guest details - we were surprised and delighted to receive 118 applications, half of whom wanted to bring at least one passenger.

GASCo provided considerable support with the event administration, including: advertising the event through their vast membership; taking bookings in the form of 'an expression of interest'; contacting everyone after the ballot and sending out appropriate details; taking payments; chasing overdue paperwork and finding last minute replacements for withdrawn attendees. GASCo also sourced further presenters as well as providing their own speaker, provided a large screen and sound system for the talks in the hangar and brought their 'voting buttons' which helped to make each topic interactive with the audience. Anyone considering holding a MCASD should definitely contact GASCo!

Once we had agreed how many aircraft could be accepted during the arrival window, we selected the aircraft at random, resulting in a broad selection of aircraft types from around the UK. Unfortunately, most applicants wanted to fly in and we had to decline many applications due to capacity. On the day itself we had 21 aircraft fly in, numerous cars and a total of 77 GA pilots and passengers in attendance. Due to only having Ground-Air radio, we closed the airfield to all aircraft other than the MCASD fly-ins and gave each pilot a slot-time for arrival. This is a good tip.

We scheduled the local aircraft to arrive first, with those arriving from further afield getting the later slots. Each slot was for 10 minutes, to allow some flexibility for arrival and each slot overlapped the next by 5 minutes, theoretically giving us one aircraft arriving every 5 minutes.

We hoped that at worst we would have 3 aircraft arrive at once – one late, one on time and one early. In fact, it was a matter of pride for the majority pilots to arrive on time, with most aiming to touchdown in the first minute of their slot… apart from one pilot who, without notice, elected to pre-position much closer to Halton the night before and arrived 1 hour 45 minutes early!

Dealing with the arrival of many more aircraft in one morning than usual required a few changes to our operating procedures. RAF Halton is a grass airfield with 3 military-affiliated flying clubs and no resident military aircraft. There are 3 Babcock employees and one military member of the airfield team enabling us to cover our opening hours over 362 days of the year. With no navaids, lighting or other tech often associated with airfields, we used the arrival slots and the Visiting Pilots Brief we sent out a week prior to the event to ensure an orderly arrivals process.

Normally we would just have an Airfield Manager (AFM) on the Air-Ground radio and ask aircraft to park near the hangars. Because of the increased number of aircraft arriving, mostly unfamiliar with Halton, we had 2 people dealing with the air arrivals and 2 helping with aircraft parking. The AFM and a club member covered the radio and used a position board to track where each aircraft was as it joined and landed, with 2 pairs of eyes needed to ensure that aircraft were routing correctly and to guard against ATZ Infringers. The Deputy AFMs helped with aircraft parking – we are not trained aircraft marshallers, so there was no marshalling, just guidance! With aircraft and cars arriving from 0900hrs onwards, some entertainment was required until the presentations started at 1100hrs. Each Station traditionally showcases its output

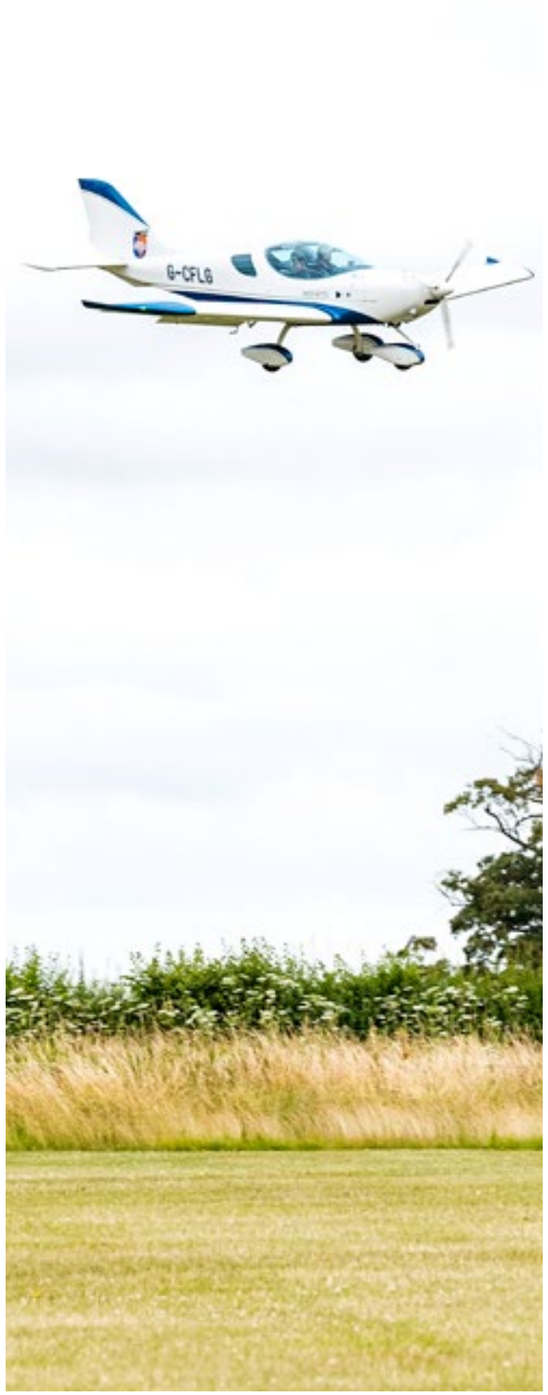
at a MCASD - having no resident military aircraft, I was very grateful to Recruit Training Squadron for showcasing Phase 1 Military Training, along with all of our Flying Clubs providing stands, drones from the Photo Air Combat Service Support Unit and Halton Model Aircraft Society as well as stands from the Apprentices' Association and Trenchard Museum. Of note, showing GA pilots the cable used for winch-launching gliders opened a few eyes to the risk of over-flying a glider airfield without calling!

After time to visit the displays, enjoy a bacon buttie and have a cuppa, the attendees heard presentations covering Airspace Infringements, causal factors and barriers in Airproxes, the value of annual flights with an instructor to cover areas of weakness and avoiding other aircraft by learning from Seagulls! The Q&A session following each presentation generated some interesting topics which could have run on for some time had we not had many events to fit in… and ranged from the benefits and limitations of different types of ATC service to GA being channelled into crowded airspace areas and different types of electronic conspicuity. We were very grateful to GASCO, the CAA, Aircraft Owners and Pilots Association (AOPA) and the UK Airprox Board for providing presenters for the event.

Lunch followed, with catering provided by the RAF Association and an opportunity for GA pilots to chat informally with the Director of the UK Airprox Board, the CAA Infringements Lead, the CEO of AOPA together with the Chairman and the CE of GASCo. Getting around 100 people through the buffet lunch area took some time so we also reopened most of the stands and permitted people to visit the aircraft line. Talking with the visiting pilots at lunchtime (and bearing in mind the results of questions answered using the voting buttons), many people had learned useful Flight Safety information during the morning!

So why should a Military Unit go to the trouble of holding a MCASD? Well, we have found that it is probably the best way to engage with a substantial number of GA pilots in a single event. You will never be short of pilots wanting to visit a Military Airfield, and it offers a great opportunity to explain your operations and any issues you are experiencing. You can choose whether to invite pilots from the local area, airfields you interact with regularly or those with a high number of infringers of your airspace or cover many areas of the country as we did. Obviously, you can focus the safety presentations on areas of concern and ensure your displays also support any theme you have.

Hopefully, the biggest learning point from the day for visiting pilots was to call Halton Radio if transiting past us! Not only are we well placed to give out information about our operations but can warn of local hazards such as cranes in the area (they seem to be multiplying at the moment) and notified drone flights (part of HS2 is within our ATZ and they have frequent surveys). Our wish is that the 77 attendees go back to their airfields and talk about their visit to RAF Halton, spreading the word that we are still open, 362 days of the year and that we are always happy to talk to passing aircraft.



Comment From the Inspector of Flight Safety – Gp Capt Mark Manwaring

The RAF Halton MCASD was a huge success and saw 77 GA pilots return to their airfields and clubs fully refreshed in the focused Air Safety topics of the day. Engagement with individuals and organisations who we share airspace with is a critical tool in the mitigation of the Mid-Air Collision risk. This ranges from daily provision of a Lower Airspace Radar Service to 6-monthly Regional Airspace Users' Working Groups, with many other out-reach activities in between. In the instance of RAF Halton, it was the unacceptable number of airspace infringements (and commensurate Airproxes) into the Halton Air Traffic Zone that initiated this MCASD – but it may be something entirely different that is drawing the attention at your unit.

As an observer and presenter at this MCASD, I could see how all elements of the day provided either new or revised information to the attendees. This was highly evident during discussions in the margins where I lost count of the number of times I heard "I didn't know that!" But what was incredibly promising was the follow-ups that spoke about consideration on how they would change their behaviour and processes in future flying activity. In addition, all speakers at the event have been asked to visit participants' airfields to replicate their presentations at a future date.

AP8000 has been revised to include guidance on planning and running a MCASD – this can be found at Leaflet 8205(1). The RAF Safety Centre stands-by to provide additional advice and guidance during the planning phase, and assistance on the day.

I finished the Air Clues Edition 36 MCASD article by saying "Downstream success does not look like empty skies for a 20-mile radius around your airfield. Instead, your event will have generated more-aware and considerate users of airspace who are now advocates of Mil/Civ Air Safety on behalf of you, their hosts." From what I saw on the day and from continued positive feedback, this is certainly true of the Halton MCASD. Now it is time to start planning your 2023 event.

The aim of a Military/Civil Air Safety Day (MCASD) is to reduce the risk of mid-air collision and other interference between military and civilian airspace users within the local area of the unit / station. (AP8000 Leaflet 8205(1)).

Defence Accident Investigation – Unit Responsibilities

by The Defence Accident Investigation Branch

The Defence Accident Investigation Branch (DAIB) provides Defence with an independent, multi-modal accident and incident investigation capability. Able to deploy worldwide, the DAIB is on standby 24/7 to conduct impartial and expert no-blame safety investigations across the air, land and maritime domains. The DAIB also provides unified tracking of all Defence Safety Authority (DSA) safety investigation recommendations through to closure. The DAIB is based at MOD Boscombe Down. The Director General DSA requires notification as soon as possible of all potentially safety-related accidents and serious incidents which result in the death or serious injury of a Service person or a civilian where it is related to MOD employment, activity or estate, and/or any significant loss of operational capability.

When deciding whether an accident or incident should be reported to the DAIB, consideration should be given to: the extent and level of any injuries sustained; any impact on or loss of operational capability; the significance of any environmental damage following the incident; the potential impact on Departmental reputation and, any early assessment of whether lessons might be learnt by Defence. If in doubt, advice and guidance should be sought from the DAIB.

As a minimum, units should notify DAIB immediately of the following to enable triage and determination of further investigation:

a. Fatalities and serious injuries. All potentially safety-related accidents and serious incidents which result in the death or serious injury of a Service person or a civilian where it is related to MOD employment, activity or estate.

b. Aviation accidents. Any accident resulting in an aircraft sustaining Category 4 or 5 damage. Any accident where an aviation system or process has failed and has compromised safety to Defence personnel or the general public.

c. Maritime accidents. Any accident that causes entire or partial disablement of a ship or submarine for service, e.g. collision, grounding, explosion, serious fire or serious flood. Any accident where a maritime system has failed and has compromised safety to Defence personnel or the general public.

d. Land accidents. Any accident where a land system has failed and has compromised safety to Defence personnel or the general public.

e. Ordnance, munitions and explosives. Any unintended initiation of ordnance, munitions or explosives resulting in damage to MOD or public property or has compromised safety to Defence personnel or the general public.

f. Fire. Any serious fire resulting in significant damage to MOD or public property.

g. Nuclear. Any nuclear accident rated 3 or above on the International Nuclear and Radiological Event Scale.

h. Environmental incidents. Any environmental incident rated as Category 1 or 2 on the Environmental Agency's scale or local equivalent level.

i. Heat illness and cold injury. In accordance with JSP 375, Chapter 41 and Chapter 42, the DAIB must be notified of all suspected or confirmed instances of heat illness and cold injury.

j. Near misses. Any incident during which death, serious injury or significant loss of capability has been narrowly avoided.

Fatalities, accidents, serious incidents and near misses are to be reported to DAIB as follows using the following numbers: Civil: 030 679 86587. Military: 9679 86587.

The DAIB used to have separate numbers for accidents in the Land domain and accidents in the Air and Maritime domains. It is in the process of consolidating to just use the numbers above for all domains. However, the old Air and Maritime numbers (030 679 88276 and 9679 88276) will continue to be answered until documentation across Defence only has the 2 numbers above. These numbers are monitored 24/7 and the duty staff will take the details of the occurrence and make an initial assessment of whether DAIB should deploy. If a unit is unsure of whether an accident or incident warrants DAIB involvement then they should inform the DAIB duty staff on the numbers provided and seek further guidance.

Once notified, DAIB duty staff will advise the originating unit of any decision to deploy DAIB investigators. The decision will depend primarily on severity of the incident as well as its consequences or potential consequences and what lessons might be learned to help prevent a reoccurrence. When completing an occurrence report via DURALS, the DAIB is to be notified by selecting the DAIB slider to 'Yes' for incidents meeting the criteria described above. However, the DAIB should also be contacted by telephone to ensure that the report is received quickly and to allow questions to be asked.

In addition to DAIB notification, Defence activity related fatalities are also to be reported to the Deputy Chief of Defence Staff Duty Officer: Civil: 030 6788 8938 or Mil: 9621 88938. For organisations under OPCOM CJO, the report should be made to the PJHQ Duty Ops Controller Civil: 01923 955311 or Mil: 9360 55310.

Defence Accident Investigation Branch:
Civil: 030 679 86587 or Military: 9679 86587

CDS Duty Officer:
Civil: 030 6788 8938 or Military: 9621 88938

PJHQ Duty Ops Controller:
Civil: 01923 955311 or Military: 9360 55310

Ground Incident Prevention - GrIP It

By the RAF Safety Centre

An RAF Flying Club member was assisting with a ground run of a DA-40 single engine civilian aircraft whilst the aircraft owner-appointed (supervising) engineer was outside. The engineer had positioned his van clear of the aircraft in the 10 o'clock position. His rolling tool cabinet was positioned in front of the left wing in the 10:30 clock position approx 2m ahead of the wing and well clear of the prop disc.

The Flying Club member aboard the aircraft attempted a start, but initially had trouble doing so. A second attempt was made that was successful; however the aircraft immediately began to move forward at such a speed that the pilot was unable to arrest. The left wing struck the tool cabinet causing a puncture to the leading edge of the wing and significant damage to the tool cabinet. The aircraft was still not arrested and was spun through 180 degrees to the left. The aircraft then impacted the side of the engineer's van where the propeller caused significant damage to the van whilst destroying all three of its blades. The aircraft was shutdown and evacuated.

This incident serves as a reminder to all personnel that ground incidents are very common and are usually the result of a Human Factors error or mistake. The RAF's rate of ground handling incidents is broadly in line with our civilian counterparts and, in fact, is broadly comparable with historical norms. Unsurprisingly, the cognitive mishaps which cause these occurrences are no different to spilling coffee, knocking into a colleague as we walk through the office, or bumping the car behind as we reverse into a space - other than the coffee, colleague or car is, in this case, a £100M aircraft and we just dinked it! That's why it's an area where we need to, and can, improve. In a shrinking organisation with fewer (more capable) aircraft, each incident can have a significant impact on both the budget (these repairs are expensive) and the capability (which means the people who operate and support it) as we must now work harder to achieve the same output with less. It's not just about money. Every 'dink' that goes unnoticed can become a serious flight safety hazard.

Taking the time to do things right will ultimately result in fewer damaged aircraft, greater availability, and thus more time, not less, and less pressure to meet output.

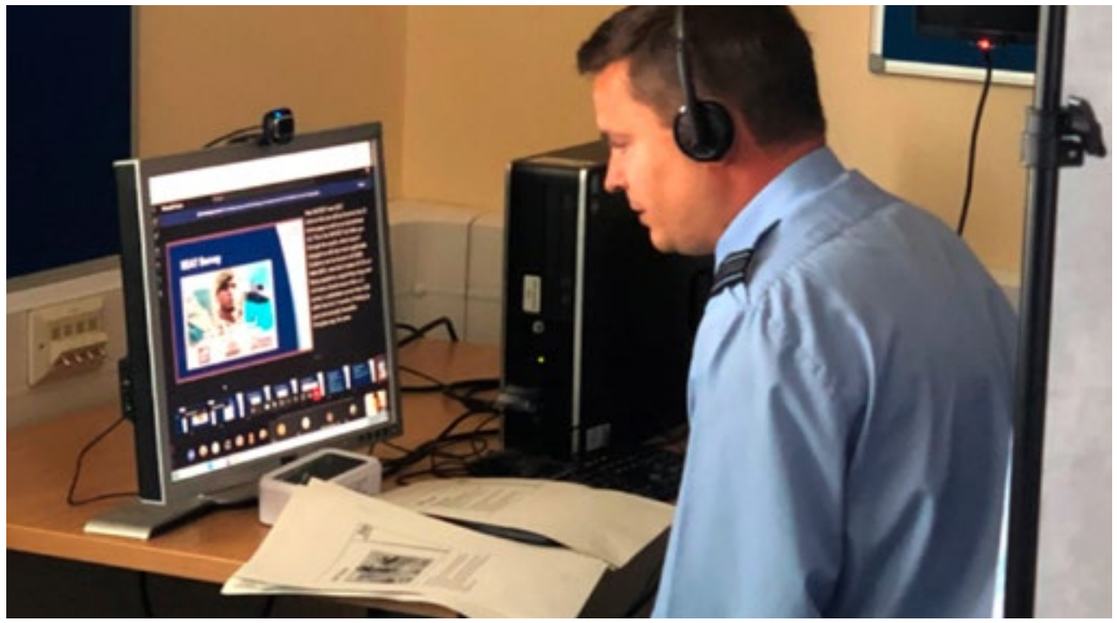
Photo: 'Dinking' a £100M aircraft

SC118
Produced by Air Media Centre, HQ Air Command.

ROYAL AIR FORCE
Safety Centre

Microsoft Licencing Changes
Does This Affect Your Air Safety?

By RAF Safety Centre



The RAF Safety Centre has seen DASORs that have highlighted the second order safety effects of a recent change to the Microsoft licencing arrangements for all MODNET Users.

Why has this happened?
Defence Digital has had to renegotiate the levels of Microsoft licences to deliver a more cost-effective and efficient solution that allows for investment in new tools and capabilities. This has resulted in the realigning of the licence categories according to an individual's MODNET usage.

This means that around 85,000 occasional users of MODNET being moved from an E5 licence, the all-inclusive licence, which provides access to the desktop versions of the main Office apps, to an F3 licence which provides online access to Office only. F3 licence holders can access Microsoft Office apps, but only through the Microsoft Office 365 (O365) web portal.

So what?
There is likely to be many personnel who use Microsoft products such as Word and Excel as part of their work and safety-related requirements, but do not meet the email criteria set out by Defence Digital.

This means that many MODNET users will only have online access to applications, which may limit your ability to access and update documents.

If you are a User who has been impacted by this change and now unable to fulfil your duties adequately, it is recommended that you request an upgrade to your account as soon as practicable.

Further details can be found via Alix for those that need to upgrade their account.

Please submit a DASOR if this issue affects air safety

Doc's Corner:
Medicine and Policy Updates Helping to Safely Improve Health for Female Aircrew and Air Traffic Controllers

By Wg Cdr David Jenkin, Deputy Command Flight Medical Officer, RAFCAM

Several female-specific Aviation Medicine issues have been progressing at the Centre of Aviation Medicine since the last edition of Air Clues was published. One of these is the approval of medical guidance and specific medicines that are focussed on the health of female aircrew and air traffic controllers. Several medicines have been approved and added to the range of options to assist with symptoms of the menopause as well as menstrual disorders, such as heavy or painful periods, and which also offer a wider choice of options for contraception.

We are also pleased to be able to assure you, as an aviator, that all the options approved have been thoroughly reviewed to make sure they can be used safely within the regulated aviation community. They have also been accepted for use by the duty holding community, within any safety limits that have been recommended for use.

It is worth illustrating the robust process that enables this assurance to be obtained. There are three stages of examination for every medicine. Firstly, the medicine is examined by RAF Aviation Medicine and Therapeutics Working Group (AMTWG). AMTWG draws on the experience of medical and pharmaceutical subject matter experts from all three services. Detailed examination of research work on the effectiveness and safety profile is undertaken for each medicine. Account is also taken of the stances adopted by other military regulatory authorities as well as civilian practice and NHS guidance. Results of this review are then presented to the Surgeon Generals Standing Committee of Aviation Medical Standards (SCAMS) which meets twice a year. SCAMS further examines the medicines suitability for approval, as well as any restrictions for the use of the medicine needed to maintain accepted aviation safety standards. Every effort is made (even if limited approval with restriction is needed to ensure safety) that approval is made wherever possible. Ultimate approval of each medicine falls within the gift of the final scrutiny committee, which is the Surgeon Generals Aviation Medical Standards Steering Group (AMSSG). AMSSG is headed by a 1* chair and includes representatives from the regulatory authority, defence safety, and the duty holding community across all three services. If a positive decision is offered at AMSSG on suitability of a medicine for approval, this is formally adopted as tri-Service aviation policy and published in AP1269A.

The medicines recently approved included Hormone Replacement Therapy (HRT) as patches and creams. These are the safest and preferred preparations in terms of aviation risk, out of a wide range of HRT options. A limited number of tablet HRT options have also been approved, with some safety limitations, where patches or creams cannot be used.

Progesterone is also required to balance any longer-term side effects of oestrogen HRT in those who still have a womb and is often included in patch preparations. For those who need to use HRT as oestrogen only cream or patches, other effective treatments including tablets and hormone releasing devices have also been approved.

Hormone-releasing devices which are effective treatments for painful or heavy periods have also been approved, along with others that are very effective contraceptive options and which can now be selected from a wide number of contraceptive choices already available.

Running in parallel with the wide selection of effective treatments that have recently been approved, a detailed review of tri-service aviation policy covering the menopause and menstrual disorders has also been undertaken. This too has also been thoroughly examined and approved within in both standing committees.

If you, or other colleagues you know, are struggling with symptoms of the menopause, menstrual disorders, or have contraceptive issues that are impacting on quality of life, or day to day function either in the workplace or at home, please arrange to visit your local Military Aviation Medical Examiner (MAME). Your MAME will be able to discuss your symptoms and help from an effective management plan with you using approved medicines if these are needed.

VHF Low Level Common
Here to Stay

By RAF Safety Centre

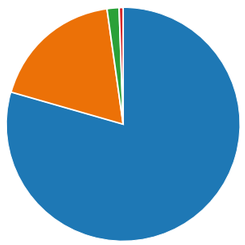
The results are in from the "VHF Low Level Common – Have Your Say survey". This has shaped the decision that the VHF Frequency (130.490Mhz) will replace the UHF Frequency and be adopted as the standard LL Common across the UK (excluding Northern Ireland).

It has been just over a year since the trial of the VHF Low Level (LL) Common was launched in June 21. With an ever-increasing trend of Military vs General Aviation Airprox below 2000ft AGL, the aim of the trial was to improve the barriers to mitigate against Mid-Air Collision (MAC) in the UK Low Flying System (UK LFS) - 0-2000ft AGL. The desired effect is to improve the Situational Awareness (SA) amongst, and to aid deconfliction between, civilian and military aircraft operating in the UK LFS when not in receipt of an Air Traffic Service (ATS). Please note, the message remains; getting a Lower Airspace Radar Service (LARS), or an ATS, should always take priority over the use of LL Common. Areas where this can't be achieved, then the LL Common frequency should be used.

Was the aim of the VHF Frequency achieved?
It was clear from the survey; the vast majority of respondents didn't hear anyone other than military aircraft using the frequency:

How many times have you received information on VHF Low Level Common from **non**-military users that has assisted with deconfliction?

Never	100
1-5 times	23
5-10 times	2
10 or more times	1



Despite this, it is heartening to see that interaction had in fact taken place and from the feedback, the frequency allowed for some positive deconfliction and SA between military and civilian users:

"I have used this airborne to deconflict with SAR aircraft in the Scottish Highlands to great effect. This de-confliction would not have been possible, with the inevitable degradation to flight safety, without a common frequency".

Therefore, this achieves the aim; albeit, not on the scale we would have hoped. It is also impossible to quantify how many civilian pilots tune into to the frequency and not speak on it; instead just listen to build SA. Several comments also discussed the secondary benefits to the VHF frequency; with better range and clarity and in some cockpits, it freed up a vital UHF radio.

Your Feedback

A common thread from the comments was there was a need for better education / promotion for the non-military users to encourage them to use the frequency more.
The RAF Safety Centre will use this feedback and continue to work closely with the CAA to help encourage better utility of the frequency; as well as becoming an agenda item on future Lower Airspace User Working Groups and Military Civilian Air Safety Days. It is hoped that over time, the frequency will become more widely known about and the numbers using the frequency will be greater.

Despite the little interaction, most respondents agreed that LL Common should remain a VHF frequency and many others saying maybe:

The most common areas where civilian aircraft were heard was Wales, Southwest England, Cumbria, Scotland and the Lake District.

This came as no surprise and was reassuring, as these are the areas where there are large gaps in LARS and ATS providers.

Another concern from the feedback was that the civilian users wouldn't understand some the terminology used by military pilots when making position calls, in particular mentioning Low Flying Areas (LFAs). From the UK Military Low Flying Handbook, the guidance on what to say over the radio should be transparent to both military and civilian crews alike:

Content:

- Call sign
- Type and number
- Position
- Height
- Heading
- Next significant reference point.

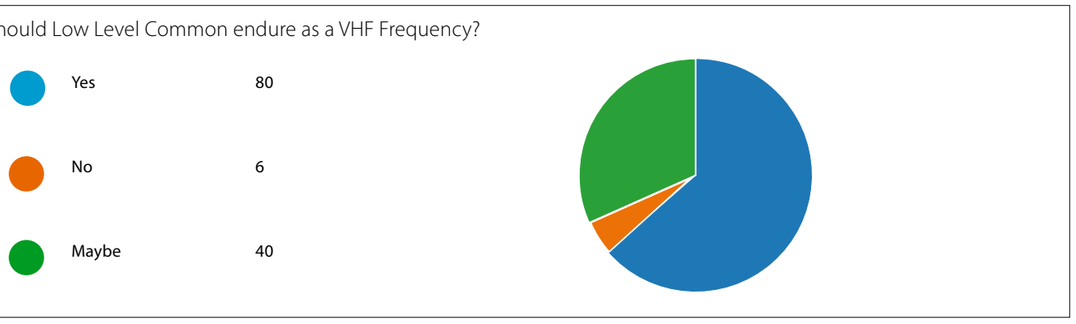
Example:

"Lossie 11, Typhoon, 8nm NE of Inverness, 250ft, heading 170° towards Aviemore"
Python formation, 2 Hawks, 5nm SE Kendal, 250ft, heading east towards Ripon"

If nothing heard, do not assume there are no aircraft nearby. Use all measures available to avoid Mid-Air Collision, and always maintain an effective lookout scan.

To conclude, the VHF Frequency will endure post the trial. It is very clear that the frequency is underutilised by non-military users.

Through better engagement from both the CAA and RAF Safety Centre, the hope is the uptake in use for the frequency will continue to grow. Where there was some interaction, the extra barrier has improved confliction awareness in all cases and the barrier should strengthen as more users utilise the LL Common frequency.



ROYAL AIR FORCE Safety Centre

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Airprox Highlights

With Comments from Wg Cdr Spry

Hawk T2 v PA28
21 Sep 21
Airprox No. 2021193

The Hawk Pilot reported that whilst at low level, adhering to a flow arrow, they noticed a civilian PA28 pass approximately 300ft above and in the opposite direction. The pilot noted that the civilian aircraft was around the corner of a valley and therefore they had no way of seeing it any earlier than they did. A TCAS TA indicated at the 'point of Airprox', with nothing before due to terrain; nothing appeared on TCAS until they had rolled out at which time the PA28 had already passed. There was no time to take avoiding action because the PA28 was overhead at the point of visual acquisition. Of significant note, they were giving positional calls on the VHF Low-Level Common frequency but nothing was heard in reply.

The PA28 Pilot reported on a land-away with a friend. They knew exactly where they passed the Hawk and had it visual as it passed below, although not on ADS-B, despite seeing other Hawks and a C-130 on ADS-B. The Hawk passed below as they were at 1800ft and slightly on the left side of the valley floor, to allow them to see up the northerly valley, looking for traffic, before committing to a turn. The pilot remarked that they should have been more visible than the Hawk as they would have been against the sky and horizon. As they looked they saw a Hawk in the 2 o'clock position at a range of 2NM, coming southbound in a left turn that was going to pass below with an estimated altitude difference of 500- 800ft. There was minimal lateral separation although the Hawk was perhaps slightly to the right. They had the Hawk in sight as it started its turn and would have been able to move laterally should there have been any conflict, which there was not so no action was taken.

For full details of this Report see AIRPROX REPORT No 2021193 on the Airprox Board Website.

Spry's Comment:

This Airprox once again raises the importance of sound lookout, as this proved to be the last remaining and most reliable barrier. It is encouraging that both pilots were using some form of Electronic Conspicuity and both using the VHF Low-Level Common frequency. However, it does remind us of the limitations to these barriers when flying low level, particularly within valleys and mountainous terrain, such as the 'Mach Loop'. That being said, they can still provide some situational awareness and should always be part of your routine and scan, with the main focus being on lookout. Past military investigations and Airprox reports have highlighted that flow arrows do not appear on civilian flying charts and therefore, civilian pilots do not need to comply with them and may be unaware of the defined direction of military low-level aircraft. As always, expect the unexpected, even when you think you are protected by the flow arrows. ☐

Voyager v Bulldog
9 Nov 21
Airprox No. 2021228

The Voyager Pilot reported that, following a number of visual circuits to touch-and-go, clearance was requested from Brize Tower for a low-approach to go-around into SID B to be followed by a radar-vectored ILS approach. Climb-out details for a SID B were received when downwind in the visual circuit and clearance for a low-approach and go-around was received after calling final. The go-around was commenced at 200ft agl (radio altimeter) and the aircraft established in the initial climb before contacting Brize Director. Thrust reduction, acceleration and flap retraction were commenced on schedule at 1800ft QNH, and shortly afterwards a TCAS Traffic Advisory was triggered with a contact directly ahead. The TCAS SOP was performed but no relative altitude was displayed on the intruder so the situation could not develop into a Resolution Advisory. No visual contact on the intruder was achieved. Just as the aircraft began to enter cloud, the safety pilot occupying the supernumerary observer's seat saw a light-aircraft (believed to be a PA28) at co-level in the 2 o'clock flying on a slightly diverging track to the north-west. There was no opportunity to take avoiding action and the aircraft passed down the right side within a distance estimated be 200m. Neither the PF nor PM gained visual contact, although the PM was aware in their peripheral vision of the fleeting presence of an object in the direction called by the safety pilot. The climb was continued, and the aircraft was levelled at 2800ft in IMC. ATC was queried about the conflict and was believed by all 4 pilots on the flight deck to have reported that the traffic was co-ordinated at 500ft above. The risk of collision was perceived by the Voyager crew as high due to the relative position and energy state of the aircraft, rendering the light-aircraft unlikely to have been able to take effective action to avoid the Voyager if the trajectories had actually converged.

The Bulldog Pilot reported that they asked for a crossing service from Brize Radar to cross Brize Zone, from Faringdon to Burford VRP's. This was granted and they remained under Radar Control (they believed) for the whole time that they were in the Brize Zone. They were told that one RAF aircraft was in the circuit. They did not see this aircraft until it passed close by them, lower and behind their flightpath.

The Brize Director Controller reported that they had no aircraft on frequency when the RA controller passed them a strip for [the Voyager]. [The Voyager pilot] had requested to depart the visual circuit for the instrument pattern climbing to 2800ft QNH, to perform an ILS approach. On initial call, the pilot reported that they had received a warning from the TCAS and asked about another aircraft that was crossing the Zone. The controller believed that the other aircraft was above the Voyager's level working RA/Zone band-boxed. When they checked the level with the RA controller, they realised it was not below 2300ft QNH and [the Voyager pilot] had climbed through that level as instructed. The Zone crossing traffic was not displaying Mode C information at the time.

The Brize RA/ZONE Controller reported that they were band-boxing RA and Zone at the time of this incident. They took over the position at approximately 1400; they were operating on RW25, weather conditions were WHT with a layer of SCT cloud at 2300ft. Most of the traffic to this point was VFR Zone transits, there was an A330 (the Voyager) in the visual circuit and the Director controller had a PA28 in the RTC3 conducting multiple approaches. Before this incident had started to unfold, the Radar controller had spotted an aircraft in the vicinity of Abingdon airfield with a Mode C indicating 201. Once this was pointed out to them, they kept track ident on the aircraft. Their recollection is that the aircraft was squawking 3601, it appeared that the Mode C was recycled and shortly afterwards the aircraft squawked 7000. The [pilot of the] aircraft subsequently free-called them on the Zone frequency to request a Zone transit. [The Bulldog pilot] requested a Basic Service and VFR transit via Faringdon and Burford. The controller approved the crossing from Faringdon to Burford, VFR not below altitude 2300ft. Once this was acknowledged by [the Bulldog pilot], they called the Tower controller to inform them of the Zone transit. A couple of minutes later, they received a call from the Tower controller stating that [the Voyager] was downwind to low-approach and was requesting a SID B for an ILS. The RA controller approved the SID B with [the Voyager pilot] instructed to contact Director on climb-out. When [the Bulldog] entered the CTR, the controller gave the pilot Traffic Information on [the Voyager]. A short time later, the pilot reported that they were visual with the A330. As [the Bulldog] was approaching the overhead, the controller noticed that [the Voyager] had started to climb earlier than they had anticipated and that the 2 aircraft would pass close together. It was too late to take corrective action at this time. VFR rules within Class D airspace require aircraft pilots to get visual with conflicting traffic and maintain their own separation against it. Because [the Bulldog pilot] had told the controller that they were visual, the controller expected them to maintain separation against [the Voyager]. As [the Voyager]

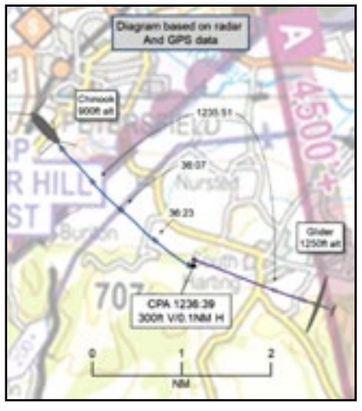
was climbing out, the Director controller informed the RA/Zone controller that the aircraft had just had a TCAS alert.

The Brize Tower Controller reported that they were advised that the pilot of [the Voyager], who was carrying out multiple visual circuits, reported an Airprox as they departed the visual circuit on a SID B. The controller felt relatively busy in Tower during this period; they had a Ground controller in position whilst they were controlling the A330 in the visual circuit and sequencing against a PA28 conducting multiple instrument approaches. Their recollection of the order and timing of events is not clear, however their description as they can recall it is as follows: They recall being informed by [the RA/Zone controller] of a VFR zone transit that would transit from Faringdon to Burford not below 2300ft. They advised [the RA/Zone controller] that they would keep an eye on it, knowing their circuit traffic was in the visual circuit at 1800ft. They do not recall whether they informed [the Voyager pilot] of the Zone transit, and do not recall the location of the Zone transit when they were informed of it by [the RA/Zone controller]. [The Voyager pilot] reported downwind that they wanted to conduct a low-approach and depart the circuit on a SID B. The Tower controller informed the [RA/Zone] controller of this who provided climbout details for a SID B and to contact Brize Director. The Tower controller provided a clearance to lowapproach to [the Voyager pilot] when they called final, and then, because [the Voyager] still had over 2 track miles until touchdown, provided climb-out details. They recall [the Voyager] conducting an early low-approach and remaining relatively high, as the controller deemed it safe to turn the RW25 traffic lights to green earlier than expected. They do not recall the position of [the Voyager] or the Zone transit when they instructed the frequency change to Director.

For full details of this Report see AIRPROX REPORT No 2021228 on the Airprox Board Website.

Spry's Comments:

This Airprox took place in Class D airspace and, as defined in (UK) SERA 5005, pilots of aircraft operating under VFR in Class D airspace are required to maintain their own separation from other VFR flights and IFR flights. Traffic Information (TI) was passed to the Bulldog on the Voyager and the Bulldog called visual; however, TI was unfortunately never passed to the Voyager crew. The first time they became aware of the Bulldog's presence was the TCAS Traffic Advisory warning. The Bulldog pilot was surprised to see the Voyager climb through their level but as they were visual, they were happy that they could achieve was safe separation (0.4NM). It would have been preferable if the Voyager crew had been passed TI to help build their awareness before they began their climb from the visual circuit through the cleared level of the Bulldog. If there is any chance of a possible conflict, then every step should be taken to build SA for all operators under your control to allow everyone to maintain safe separation. ☐



Chinook v HPH Shark
22 Nov 21
Airprox No. 2021233

The Chinook Pilot reported that during a low-level transit to Tower Hill on the South Downs, their crew had just identified the target on top of the ridge line which was about to be recce'd prior to flying a fast rope assault profile. Shortly after the target had been identified, the handling pilot (RHS) made a threat call for a no-factor aircraft in the 12 o'clock high position at about 5NM. Immediately after identifying this aircraft, and on starting to look back down toward the target, they (non-handling pilot LHS) noticed the profile of an un-powered glider at the same level in the 11 o'clock. It was pointing directly towards them and was in a very slight right-hand bank at a distance of around 300m. Their immediate assessment was that both aircraft would have become too close to maintain safe separation without intervention and they simultaneously called for the handling pilot to "come right descend", making the control movements required themself before formally taking control. The glider passed down the left-hand side of their aircraft, slightly above, with about 200m separation, seemingly flying in a WNW direction following the ridge line. It did not appear that the glider pilot had taken any avoiding action. On reflection, they believe that had no action been taken, both aircraft would have very narrowly avoided a collision however, their wake turbulence would likely have caused the glider pilot some issues. An Airprox was reported to the RAF Odiham Approach controller shortly after the event. They noticed that their heart rate increased during the event and then returned to normal after the RT report. Having confirmed that the crew felt fit to continue the sortie, they continued to operate in the vicinity of the South Downs between Tower Hill and Arundel for the next 15min. They noted approximately 15-20 gliders transiting along the ridge line at heights varying from about 1000ft agl to just above the top of the ridge3. With Odiham Approach operating without a serviceable Watchman, they elected to inform ATC of the intense glider activity in the area. After recovery to RAF Odiham without further incident, they discussed the event with the Duty Authoriser. They noted that although they had discussed the risk of MAC and associated mitigations in the brief and out-brief, neither of them had checked Glider-Net prior to walking out. Although this will have only indicated the gliders airborne at the time, this may have provided an idea for how busy the area could have been. Shortly after landing, Glider-Net showed a significant number of gliders transiting along the ridge line of the South Downs.

The Glider Pilot reported that they were flying along the South Downs using the ridge for lift as it was a northerly wind. There were 37 other glider pilots flying the ridge that day, most of whom were using the same route, from Lewes to Petersfield. They did see a Chinook helicopter manoeuvring to the north of them approximately 1NM plus away. Had it been closer they [opined that they] would surely have heard it and had they done so then they would have reported it on the radio to alert other glider pilots.

The Odiham Approach Controller reported that the Watchman had failed earlier in the day and they were therefore operating SSR alone on Radar when, at 1238, a [Chinook pilot] reported that they had just had an Airprox. The pilot informed them that they were flying west-to-east and saw a glider travelling east-to-west, in their 11 o'clock. The pilot reported taking avoiding action by breaking right and commencing a descent. The pilot passed the grid location which, after putting that through a conversion website, tallied with the latitude and longitude that they had noted for the Airprox. The minimum separation from the glider was reported [by the pilot] as being 700ft vertically and 200m laterally. They were unable to identify any confliction as the aircraft was low level, and the conflicting aircraft was not transponding.

For full details of this Report see AIRPROX REPORT No 2021233 on the Airprox Board Website.

Spry's Comments:

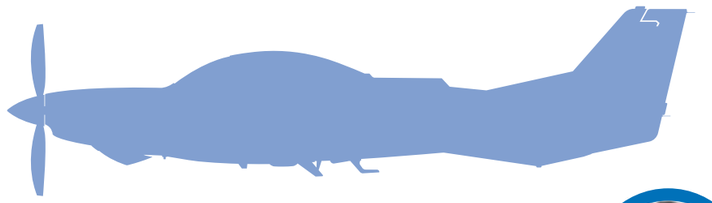
This Airprox highlights the importance of lookout and that, whilst a useful aid to situational awareness, crews are not to be wholly reliant on Electronic Conspicuity (EC). The glider was equipped with EC incompatible with the Chinook's and its transponder was turned off making it invisible to both the Chinook TAS and Odiham ATC with their Watchman Radar U/S. The crew acknowledged that they omitted to check Glider-Net prior to the sortie; this might have alerted them to the gliding activity and to be more aware (even though they did spot the conflicting traffic). Whilst Glider-Net provides time-sensitive information (i.e., that activity taking place when checked pre-sortie), it can, over time and with experience, provide an intelligence picture of hotspots to be aware of and trigger extra vigilance among a crew when in those areas. If you are aware of potential gliding activity taking place along or in the vicinity of your route, it is always worth considering a Traffic Service over a Basic Service or to contact another LARS agency if you are aware of primary radar unserviceabilities. Given all the above, the only barrier which really prevented any further incident was good lookout. It is worth noting that gliding takes places all year round but most long thermal cross-country flights, particularly in England, are conducted through the warmer summer months. That said, clubs in hillier regions of the UK- most of Scotland, Wales and the Pennines, often encounter some of their best soaring conditions during the autumn and spring. In the main, the optimal conditions for gliding are sunny and not too windy. ☐

ASK21 v Prefect
3 Aug 21
Airprox No. 2021139

The ASK21Glider Pilot reported that, whilst instructing a student on where to start a base leg, they saw the other aircraft 500m to the left of their glider and then disappear underneath them travelling south-to-north at high speed.

The Prefect Pilot reported that, after a touch-and-go at Cranfield airfield, the student Observer continued low-level to the north at 500ft MSD1 to identify their next turning point. During the transit they became distracted by airsickness. The turning point was subsequently misidentified, turning on a motorway junction 2NM further north than planned. The QPNI 2 turned on heading and approximately 1min later spotted Husbands Bosworth glider site in the right 3 o'clock at approximately 1.5NM (route study had planned for the glider site to be clear to the right of the aircraft). The QPNI then spotted a single glider in the 3 o'clock (with associated alert [from their on-board electronic conspicuity equipment]) approximately 200ft above and 500ft laterally clear in a slight climb. Due to speed of overtake, no avoidance action was required as there was clear and obvious separation. They regained track and continued the sortie without further incident. Of note, Husbands Bosworth is not marked on the electronic chart for QPNI situational awareness.

The Wittering Zone Controller reported that they were the controller training in Zone at the time of the incident, and had Prefect [c/s], on frequency. They do not have full recollection of the aircraft due to the time that has passed since the date of occurrence. The [pilot of the] Prefect in question came onto their frequency from Cranwell, requesting transit towards RAF Marham before descending low-level to roughly 500ft. As the aircraft transited along its navigation exercise route, the controller's track ident diminished due to the display clutter and other tracks along the route. They lost radar contact and downgraded the service from a Traffic Service to a Basic Service. For the duration that the aircraft was on frequency, they made little communication due to the nature of the service being provided. They did, however, conduct a radio check with [the Prefect pilot], as well as request the next turning point, to which [the Prefect pilot] responded "Husbands Bosworth" [UKAB note: the transcript shows that the Prefect pilot responded with "Market Harborough"]. Shortly after this, [the Prefect pilot] called Practice Pan for a visual PFL at RAF Wittering. The controller requested that they squawk ident and, once positively seen, [the Prefect pilot] was identified, given a Traffic Service and given a steer of 070° for RAF Wittering. For the duration of the aircraft on their frequency, no calls were made, or information passed, on a possible Airprox or any close proximity of traffic.



For full details see Airprox No 2021095 on the Airprox Board website.

Spry's Comments:

Unfortunately, airsickness caused a significant distraction to the student Observer for them to misidentify a turning point. Route study prior to the flight meant that their route avoided Husbands Bosworth glider site; however, with the error in turning point and the Qualified Pilot Navigator Instructor (QPNI) turning on time, the Prefect flew straight through the glider site with very limited awareness. Thanks to the on-board electronic conspicuity equipment, the QPNI was able to pick up a glider within the boundaries of the glider site and was able to assess that their flight path meant that there was no risk of collision.

How could this happen? Unfortunately, the Prefect's electronic mapping didn't have Glider sites marked on them and the QPNI also wasn't carrying a paper map. The first clue of a glider site infringement was the proximity of a glider. Having glider sites marked on the electronic mapping and the pilot carrying a paper map would have gone someway to mitigate the risk of this infringement. It proves to demonstrate how compounding holes in airborne barriers coupled with a bit of distraction can lead to an uncomfortable situation. It must have come as a shock to the glider pilot who was operating within the circuit at the glider site.

Safety Contacts:

Group / Station / Unit	Flight Safety Officers	Health, Safety & Environmental Protection Advisors
1Gp	01494 495454	-
2Gp	01494 495049	-
11 Gp	0300 165 7695	-
22 Gp	030 6798 0101	-
Air Support	01494 497923	-
BM	95760 3230	
JHC	01264 381526	-
Test & Evaluation (ASWC)	01522 727743	-
1ACC	01522 603359	-
2FTS	01400 264522	-
3FTS	01400 267536	-
4 FTS	01407 762241 6666	-
6FTS	01400 266944	-
Air Cadets (RAFAC)	-	01400 0267817
Boulmer	01665 607325	01665 607282 / 7289
Benson	01491 837766 6666 / 7525	01491 827109 / 7254
MOD Boscombe Down	01980 662087	01980 662312
Brize Norton	01993 895764 / 6666	01993 895525 / 7062
Coningsby	01526 346575	01526 347256 / 7196
Cosford	01902 704037	01903 37472 / 237
Cranwell	01400 266666	01400 267469 / 7498
Defence Geographic Centre	0208 8182816	94641 4816
Fylingdales	-	01751 467216
Halton	01296 656666	01296 656640
Henlow	01462 851515 6150	01462 857604
High Wycombe	01494 494454	01494 496489 / 5094
Honington	01359 236069	01359 237782 / 7516
Swanwick	01489 612082	-
Leeming	01677 456666	01677 457637 / 7231
Leuchars	01334 856666	-
Linton-on-Ouse	01347 848261 6666	01347 847422 / 7617
Lossiemouth	01343 816666 / 7714	01343 817796 / 7697
Lynham	-	01189 763532
Marham	01760 337261 6666	01760 337595 / 7199
No1 AIDU	02082 105344	-
Northolt	020 8833 8571	02088 338319 / 38521
Odiham	01256 702134 6666 / 6724	01256 702134 7650 / 7733
Scampton	01522 733053	01522 733325 / 3137
Shawbury	01939 250351 6666	01939 250351 7529 / 7559
Spadeadam	-	01697 749204
St Athan	01446 798394	01446 797426 / 8250
St Mawgan	-	01637 857264 / 7858
Syerston	01400 264522	-
Tactical Supply Wing	95461 7177	-
Valley	01407 762241 6666	01407 767800 / 7685
Waddington	01522 726666	03001684954
Wittering	01780 416377	01780 417611
Wyton	01480 52451 7554 / 7146	-

Overseas Flight Safety Contacts	Telephone	Email
Al Udeid	9250 060 451 3043	83EAG-DepFSO@mod.gov.uk
Ascension	00247 63307	BFSAI-ASCOpsOC@mod.gov.uk
Akrotiri	94120 6666	Leigh.Robertson677@mod.gov.uk
83 EAG	9250 060 451 3050	83EAG-AIROPSFSO@mod.gov.uk
Gibraltar	9231 98531 3365	GIB-RAF-ASM@mod.gov.uk
MPA	00500 75490 or 94130 5490	BFSAI-AirOpsWg-ASM@mod.gov.uk
Tactical Leadership Programme	0034 967 598527	aa3@tlp-info.org
Naval Air Station Jacksonville	001 904 542 4738	-

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