

# AirClues



Doc's Corner  
**"Break Off"** – Aviation  
Dissociative Phenomena

**Actions to Stay  
Protected from the  
Cold this Winter**



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# Foreword

By Gp Capt Andrew 'Boomer' Keith,  
Inspector of Flight Safety



Group Captain Andrew Keith

You will observe an underlying theme to some of the content and imagery in this Issue of Air Clues – cold weather. Climatic injuries are of particular focus in Defence at the moment and despite an unseasonably warm Autumn I would expect winter to be fully upon us by the time you read this. It is important for you to recognise how vulnerable you can be when working outside in cold weather. Individuals and line managers alike need to ensure that appropriate protection is adorned, especially if you are prone to long periods of inactivity, such as guard duty. Make sure you take regular breaks and you have access to suitable hot rations, and cover up exposed areas such as the hands, neck and especially your head. This may sound

like common sense but we often see a disconnect between common sense and common practise! If you don't have enough protective clothing for the work you are conducting, you must speak up. The article by the USAF Technical Sergeant, 'A Pocketful of Skittles', also warns us about the onset of fatigue in cold weather activity. This not only relates to your ability to carry out your duties but, because so many of us live off-base, we must be conscious of the dangers of driving whilst tired.

In my role as Inspector of Flight Safety, I would like to thank you all for a year of concerted effort to get the job done safely. In what feels like a time of increasing demand against taut resource, it is all the more important to have safety at the centre of everything we do. Safety should be embedded in all of our processes, end-to-end, and this in turn will allow greater operational freedom and a more effective force ready to fly and fight. If you look at the historical article extracted from a 1942 Air Ministry Pamphlet (Air Sense), you will read how they talk about hundreds of avoidable flying accidents every month! Yes, it was wartime and a huge national effort was underway, but I think you would have to agree that safety has improved immeasurably since then. Let's continue our safe record into the next year.

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



**Flight Lieutenant Owczarkowski – 6FTS – Green Endorsement**

Flight Lieutenant Owczarkowski was the instructor for a Tutor aircraft sortie from Royal Air Force Wittering. The forecast weather was poor, but suitable for the sortie profile. After climbout, as the student levelled the aircraft, Flt Lt Owczarkowski noticed a brown smear that had appeared on the windscreen. At that instant, the windscreen iced over, severely limiting visibility. With no signs of oil loss and the engine running smoothly, Flt Lt Owczarkowski instructed his

student to descend the aircraft into warmer air to melt the ice. Whilst looking towards Wittering, he noted the cloud was building rapidly which had ruled out a visual recovery to Wittering, but he could see Kendrew Barracks. Shortly after levelling off, and whilst orbiting close to Kendrew Barracks, the ice started to melt and stream back up the windscreen as water. The initial effect was an improvement in forward visibility but, almost immediately, a film of oil quickly covered the windscreen leaving the crew almost completely blind.

As he was unsure as extent of the oil leak, an instrument recovery to Wittering could have been disastrous, but Flt Lt Owczarkowski determined that the runway at Kendrew Barracks appeared suitable and so took control of the aircraft and transmitted a MAYDAY to Air Traffic. After quickly configuring the aircraft to land, Flt Lt Owczarkowski turned towards the runway, but realised it would not be possible to make a normal approach because there was zero visibility through the windscreen. He instructed the student to open the canopy and despite strong buffeting in the cockpit from the slipstream, utilised exceptional skill to make a continual curving approach, only rolling wings level at the last possible second. Flt Lt Owczarkowski braked firmly with only lateral vision available to gauge direction and landed the aircraft safely.



**RAF Shawbury ATC Team – Team Commendation**

Left-Right: AS2 Wookey, Sgt Shingler, Gp Capt Baron, AS1 Roberts, Flt Lt Nicholas, WO Paul Fisher (Sgt Chamberlain not pictured).

The RAF Shawbury Air Traffic Control Team were responsible for the timely response to a potentially serious Foreign Object Debris (FOD) incident at RAF Shawbury. During a training session in the Aerodrome Control position, contractors were spotted disposing of waste in the vicinity of Hangar 1; work had been ongoing on a replacement roof on the hangar for a number of weeks. The debris, including various loose paper articles and hangar roof cladding, were then seen to be blowing, uncontrolled, across Aircraft Servicing Platform 1 (ASP 1) towards ASP 2 which is used for refuelling and the parking of multiple helicopters. The team sprang into action an coordinated a rapid response to ensure routine operations were protected.



**Flt Lt Nurse – RAF Gibraltar – Commendation.**

A uniquely complex airfield, RAF Gibraltar faces the challenge of thousands of pedestrians, scooters, cars and motorbikes crossing the runway every single day. The Stn Cdr's top hazard is the reach of the Air Safety Culture, and Flight Lieutenant Nurse has gone to great lengths to build relationships across Gibraltar to influence the behaviour and Air Safety awareness of the population. He was commended for many initiatives to improve relationships with local government and to improve flight safety awareness on the unit.



**Air Specialist (Class 1) Murdoch – 78 Sqn – Good Show**

Receiving his award at RAF Lossiemouth (AS1 Murdoch's new posting).

Air Specialist (Class 1) Murdoch was the Air Systems Operations Specialist working in the Distress and Diversion (D&D) Cell at 78 Squadron, Swanwick when a civilian light aircraft called up on the Emergency VHF channel declaring an MAYDAY. The pilot of the light aircraft had lost contact with the ground as they descended inbound to Turweston airfield due to fog. The pilot was stuck between the cloud base and fog and quickly disorientated in instrument meteorological conditions for which the pilot was not rated nor the aircraft equipped. During the climb the pilot declared an emergency on the Emergency VHF channel to which AS1 Murdoch responded. AS1 Murdoch reassured the pilot and issued D&D's 3307 Squawk; he immediately called the absent controller back into D&D whilst maintaining two-way communication with the pilot until the controller's return. AS1 Murdoch then called multiple aerodromes to find locations that were both clear of weather and suitable for the aircraft to land; the aircraft landed safely at Birmingham International Airport.



**Corporal Scott Brown – RAF Lossiemouth – Well Done**

On 22 September 2022, a fuel spill occurred on Runway 23 at RAF Lossiemouth. Accordingly, Runway 28 was in use to recover five station-based aircraft and a pair of visiting F-35 aircraft for refuelling. Once the lead F-35 was on final approach to Runway 28, there was an unusually large amount of bird activity on finals. Corporal Brown recognised the need to pass a warning of birds to the Aerodrome Controller, which was then passed to the aircraft. As the aircraft continued the approach, further bird activity was noted, and Corporal Brown recognised that there was the potential of a bird strike and took the decision to fire a red very flare which resulted in the approach being broken off. The second F-35 landed from their initial approach with the lead F-35 landing off its second approach safely.



**Mr Des Brayne – RAF Shawbury (AHUK) – Well Done**

Following an Instrument Rating Test sortie, a Juno helicopter was landed and prepared for a rotors running refuel. Once the refuelling safety brief had been completed, the refuelling supervisor called in the refuelling team. Mr Des Brayne, in his role as the hose operator, noticed an oil leak around the port rear of the Juno and signalled this to the refuelling supervisor. Refuelling was ceased and the team cleared the disc. There were no cockpit indications of an oil leak, but the Nr was reduced to IDLE in preparation for a shutdown and an engineer assessed the leak. The Juno helicopter was shut down without further incident. Upon egress, the crew noted there were oil spots on the ground around the aft of the Juno.



**Mr Graham Tart – RAF Shawbury (AHUK) – Well Done**

On 19 April 2023 Mr Graham Tart was tasked with carrying out tests on the hydraulic system on a Juno aircraft in base maintenance. This was a functional test of the hydraulic valve block, checking that relief valves operate and re-seat at the correct pressure. During the pre-use check, Mr Tart removed the lid from the Enerpac hand pump and observed that it had clear fluid in the oil reservoir instead of the pink aircraft hydraulic fluid. He correctly stopped work at this stage and questioned what he had found. It was then discovered that Enerpac Hand Pump had been refilled earlier the same week with the wrong fluid while in use on another aircraft. It was also discovered to have been used on one other aircraft in base maintenance.



**Air Specialist (Class 1) Lindsay – RAF Wittering – Well Done**

On 27 March 2023, at RAF Wittering, Air Specialist (Class 1) Lindsay, a driver from No 1 (Expeditionary Logistics) Squadron, Station Motor Transport, was tasked to carry out sweeping duties shortly after dark. After completing his Daily Inspection of the vehicle, he noticed the lights of 2 Hilux vehicles that appeared to be parked near the runway. He approached the vehicles to discover that they were members of Tactical Air Traffic Control from RAF Brize Norton and were in location to provide controlling services to C-17 Globemaster and A400M Atlas aircraft operating at the airfield as part of a night flying exercise. Air Specialist (Class 1) Lindsay had now discovered that night flying had been scheduled and that runway sweeping duties would cause a serious and undetected conflict. He returned to base and reported the issue.



**Air Specialist Class 1 (Technician) Croak – RAF Coningsby (BBMF) – Well Done**

On 23 May 23, at RAF Coningsby, and following a Helitune propellor balancing on a Spitfire Mk IIa, Air Specialist Class 1 (Technician) Croak was tasked to refit 3 engine cowls to the aircraft. AS1(T) Croak noticed that a lock nut and washer were missing from the forward upper oil tank retaining bracket. Further inspection revealed that another bolt was loose and could easily be removed by hand.



**Mr James Cunningham – 3FTS – Good Show**

Mr Cunningham is a very experienced Operations Officer working in support of Prefect operations with 57 Sqn at RAF Barkston Heath. During the morning of 20 Dec 22, In preparation for the upcoming airspace document update cycle, a check was carried out on the CALF booklet dated 29 Dec 22 for local area / Low Flying Areas. Within the section for area 11 (which was also identified as incorrectly annotated under area 1B) there was a notification stating the removal of a restricted area designated R 313 with guidance that this was to be "deleted in total".

Unaware that such a decision had been taken, nor a provision put in place as a replacement area for the Red Arrows to carry out practice displays, Mr Cunningham took it upon himself to query this information with a number of local area personnel; it was confirmed that no such decision had taken place. Incidentally, this is Mr Cunningham's second Good Show in the space of a year.



**RAF Benson Road Safety Team – Team Commendation.**

L to R: Sqn Ldr Wright, AVM Marshall, AS1 Leask, Cpl Marshall. AS1 Patel & Sgt Holmes not pictured.

On 6 December 2022, the Royal Air Force Benson Road Safety Committee presented a high impact video at a Station Briefing. The video focused on drink driving and operating a vehicle in poor weather conditions. Road traffic incidents are recognised as posing the greatest risk to life to Service personnel across Defence. The video was made available for Station personnel to view via a SharePoint link and the impact across the entire work force was immediate. The team responsible for producing this exceptional video consisted of: Squadron Leader Wright, Sergeant Holmes, Corporal Marshall, Air Specialist (Class 1) Leask and Air Specialist (Class 1) Patel.



**Sergeant Shaw – RAF Odiham – Well Done**

On 23 November 2022 at RAF Odiham, Sergeant Shaw was the aircrew duty crew member of the day and was tasked to complete a rotors-turning ground run on a Chinook aircraft which required engine vibration maintenance ground runs. Whilst the aircraft captain was signing for the aircraft, Sergeant Shaw began his pre-flight aircraft walk round. Upon inspection of the ramp area, he noticed that the collar (approx. 14 inches in diameter) connecting the rear transmission cooling fan to the cooling fan vent was not connected and that an internal section of the collar was resting loosely inside the space behind the fan. Sergeant Shaw highlighted this to the engineering team in attendance who were then able to confirm that the outer collar component was missing.



**Air Specialist Class 1 (Technician) Stiles – RAF Odiham – Well Done**

On 31 January 2023, at RAF Odiham, Air Specialist Class1 (Technician) Stiles was acting as safety man for a single engine ground run post compressor wash on a Chinook aircraft when he noticed excessive movement of the exhaust centre pipe on the No1 Engine. Raising the fault to his desk Senior Non-Commissioned Officer AS1(T) Stiles then highlighted that a Technical Instruction (TI) was previously released with regards to excessive movement of exhaust assembly and was carried out every 100hrs.



**Flight Lieutenant Burke – RAF Valley – Good Show**

On 12 April 2023 Flight Lieutenant Burke was the student pilot of the number 2 aircraft in a pair of Texans operating South of RAF Valley, conducting Line Abreast formation training. After 20 minutes of medium level manoeuvring the pair descended to low level and commenced a pre-planned low level navigation route on the Llyn Peninsula. Shortly after entering low level Flight Lieutenant Burke's rear seat Instructor declared that he was feeling unwell and directed him to return to RAF Valley expeditiously. Flight Lieutenant Burke immediately and simultaneously informed the formation leader of the situation, advanced the throttle to full power while turning towards Valley and climbing out of low level. He contacted RAF Valley ATC and informed them of his immediate recovery with an unwell rear seat occupant and asked for medics to meet the aircraft on landing. After further questioning of his instructor, and confirming that he was still feeling unwell, Flight Lieutenant Burke declared an emergency to ensure priority on entering the Valley visual circuit, and squawked emergency, before recovering to Valley.



**Flight Lieutenant Burr – RAF Brize Norton (TAC ATC) – Well Done**

On 26 July 2023 Flight Lieutenant Burr was operating as the ATCO IC at Schoonover Temporary Landing Zone (TLZ) on exercise during NVG Unprepared Runway Operations involving an A400M aircraft. At the time of the event, Flight Lieutenant Burr was overseeing vehicles enter the runway whilst his support controller was taking met observations. He immediately entered the runway surface and initiated a FOD sweep of the 500ft take off box independently; in doing so he confirmed an object was dropped from a vehicle, finding an iPhone on the runway surface.



**Master Aircrewman Seaton – RAF Brize Norton (ASWC) – Well Done**

On 9 May 23 an A400M aircraft departed Brize Norton and climbed into the Yeovilton/Boscombe area to conduct a trial training event. Having just levelled off, with no fumes or smell of any note, Master Aircrewman Seaton highlighted to the flight deck crew that a thin haze layer had just appeared in the rear cabin, which the flight deck crew assumed initially to be that of a well-known engine oil aircon issue. The crew swiftly checked the capability matrix and recognised that the aircraft had the vent ejector oil smell reduction mod embodied and the rear crew could now taste a subtle acrid note on the back of their mouths. Of note, the taste was not obvious and there was no smell nor discernible indications on the flight deck. During the recovery Master Aircrewman Seaton informed the flight deck crew that the situation was deteriorating further in the rear cabin and this, in turn, energised the decision to expedite the recovery.



**Sergeant Baxendale – RAF Brize Norton – Well Done**

On 16 Nov 2022, Sergeant Baxendale was the Air Loadmaster of a C-17 crew operating from RAF Akrotiri to Thumrait in Oman. On arriving at the aircraft on 16 Nov 22, there was 1 pallet of Dangerous Goods to be loaded. Once the pallet was loaded, Sergeant Baxendale conducted a paperwork check. He then noticed that the DOME database printout and dispensation was missing. Sergeant Baxendale correctly applied the rules and stated that the correct paperwork must be handed to him before the flight could depart. The Akrotiri movements team stated that this would incur a time delay, as the aircraft was on Echo ramp and the movements office was near the air terminal. Sergeant Baxendale did not allow the task time pressure to affect his professionalism or judgement and stated that the aircraft would not depart without said paperwork.



#### Corporal Hart – RAF Brize Norton – Well Done

On 7 July 2023, whilst on Exercise in California, USA, Corporal Hart, a recently qualified Airborne Forces Equipment JNCO supervisor was supervising a main parachute repack of a used Multi Mission System 533. During this repack she noticed that the Quick 3 spring had moved position within the reserve container. This caused the spring to become misaligned within the container and, upon further investigation, the reserve pins were also found to be loose. Corporal Hart believed this to have happened due to the lengthening of the closure loop as the period of life had almost expired on the 26 weekly maintenance schedules. She decided, as the supervisor, that she was not happy with this so decided a full maintenance was required to be carried out on the reserve and main before it's next use.



#### Flight Lieutenant Jewell – RAF Brize Norton - Commendation

Flight Lieutenant Jewell has made an exceptional contribution to Voyager Force Air Safety. He singlehandedly managed all Voyager Force Air Safety and Human Factors competencies for the 500 personnel on Voyager Force; identifying and organising courses including ASMSO, FLAC, FSC, FSOC, DHASC, HF Facilitator, MASRAMP and Bowtie courses for everyone from NCO to Sqn Cdr.. His work as a Flight Safety Officer delivered excellent DASOR reviews, leading the coordination of monthly Action Groups and producing high-quality safety promotion material, keeping all ranks and roles informed of top risks and safety priorities. His regular and inclusive engagement with AirTanker contractors maintained good relationships to ensure that the civilian and military systems were aligned.



#### Flight Lieutenant Hamilton – RAF Brize Norton – Good Show

On 12 February 2023, Flight Lieutenant Hamilton was the Captain of an RAF Hercules aircraft that was deployed to

RAF Akrotiri to provide aeromedical assistance to Turkey following a severe earthquake. On the very first mission, when he was tasked to take a medical team to Turkey, on approach to land at Incirlik airfield, the crew was alerted to a hydraulic leak and actioned the emergency drills. Subsequent investigation highlighted the utility hydraulic reservoir was depleted and fluid was seen to be venting from the No.2 engine. The system could not be restored, and the crew was forced to isolate the entire utility hydraulic system responsible for servicing several aircraft systems including the landing gear and wing flap control systems. The failure meant that undercarriage and flaps had to be manually lowered and that there was no nosewheel steering or normal braking available on touchdown. After calmly briefing ATC on the situation, Flight Lieutenant Hamilton landed safely and used differential power to keep the aircraft on the runway.



#### Corporal Hart – 902 EAW – Commendation

On 16 June 2023, 902 Expeditionary Air Wing (EAW) was asked if the EAW could offload a high-value, 13-tonne cargo from an A-400M Atlas C1 aircraft urgently required to rectify a fault on a Royal Naval vessel in the vicinity. The task required Air Cargo Handling Equipment (ACHE), which was a known deficiency at 902 EAW. Despite implied operational pressure to use inadequate equipment to complete the task, the team stood firm and awaited a suitable solution to be in place.



#### Flight Lieutenant McLean – RAF Brize Norton – Good Show

On 30 November 2020, Flight Lieutenant McLean was the co-pilot of an RAF C-17 aircraft conducting Pilot Flying duties on the return leg of a sortie from Dakar, Senegal to RAF Brize Norton. Although recently Combat Ready, he still had less than 400 hours on the Boeing C-17A Globemaster III, and 550 flying hours in total. The aircraft already had one air conditioning pack locked out after Flight Lieutenant McLean had managed

its failure while flying in Theatre. Nonetheless, as he initiated a timely descent for recovery into Brize Norton, a Right-Wing Anti-Ice Temperature Low system failure alerted itself on the Warning Annunciator Panel (WAP). Just as the crew resolved this issue, the remaining air conditioning pack failed and put the aircraft into a 'Loss of Pressurisation' condition. Flight Lieutenant McLean called for the appropriate checklist and donned his oxygen mask. He requested an emergency descent and, once that had been coordinated with ATC, he initiated an autopilot-controlled descent to Flight Level 100 at 310 knots. Once established, he made the sensible decision to increase the speed to 320 knots to expedite the rate of descent while remaining safely within aircraft limits. During the descent, there were several other unexpected WAP alerts, including a Number 3 Engine Bleed Temp High and associated alerts for the No. 3 Engine 'Shutoff Valve Disagree' and the No. 3 Engine 'Anti-Ice Disagree' which created a high number of distractions in the already dynamic environment. Flight Lieutenant McLean identified a suitably clear flightpath in which to remain clear of icing conditions and he maintained a high level of situational awareness on conflicting traffic whilst recovering the aircraft safely.



#### Air Specialist Class 1 (Technician) Sadler – RAF Brize Norton - Well Done

On 28 June 2023, as part of a 2-person C-17 engineering crew, the Ground Engineers crewed in for a C-17 task from RAF Brize Norton to RAF Marham. During inspection of the aircraft, Air Specialist Class 1 (Technician) Sadler noticed that part of a harness that connects to the main landing gear wheel speed transducer was resting in a crevice between 2 moving parts and notified the Ground Engineer. On further inspection, it was noticed that the moulded harness on the wheel speed transducer was sheared, causing the cable that connects to the transducer to route incorrectly into the crevice.



**Sergeant Holland & Sergeant Jones – RAF Brize Norton – Well Done**

During an operation in Sudan, there was an intensified effort to get an increased amount of freight through RAF Brize Norton to support enablers as the operation gained momentum. This requirement put immense pressure on Air Movement Wing staff to meet the desired output. 99 Sqn Air Loadmasters (ALMs) were constantly dealing with late or no-notice load plan changes, inaccurate or non-existent paperwork and cargo that was not fit for Air Transport. Sergeant Holland and Sergeant Jones, despite increased operational necessity to get an item of freight loaded and airborne, had the courage of their conviction to remain within the limits of loading. As a large ISO container was being secured into the aircraft, the ALM noticed that there was a generator attached to it. Paperwork for this item was all in order, however, on completing final checks, the ALM noticed that the generator was nearly 3/4 full of fuel. The 2 Sergeants used the DGM/IATA manuals to calculate that taking this airborne would be likely to lead to a fuel spillage which in turn would lead to a 'smoke & fumes' situation for the crew.



**Air Specialist (Class 1) Veal – RAF Brize Norton – Well Done**

In May 2023 Air Specialist (Class 1) Veal rejected a 5-piece consignment of Air Freight that had been consigned from RAF Spadeadam via R&D at RAF Leeming and which was documented as general non-dangerous cargo. However, on closer inspection of the available information, Air Specialist (Class 1) Veal discovered it contained, not only Class 2 ACTO material (Body armour, Helmets and Respirators), but also hidden Dangerous Goods (DG) in the form of Lithium Batteries.



**Air Specialist (Class 1) Robson (of RAF Benson) receives a BFSAI MPC Air Safety Award in theatre.**

Shortly after arriving at MPC, AS1 Robson identified a lack of Dangerous Goods awareness media within the HSS departure lounge. With initiative he researched Support Helicopter specific DG posters and advice. Sourcing the posters and displaying them in the departure lounge has resulted in 3 occasions stopping DG that could have been moved by air without the correct preparation and documentation. As the unit's DG SME he has actively engaged with the multiple sections at MPC, educating those wishing to fly with DG the correct process and making them far more DG aware.

# Defence Aviation Safety Conference 2023

By the RAF Safety Centre and SAE Media Group



Image: 2023 Defence Aviation Safety Conference

The 2023 Defence Aviation Safety Conference, organised by the SAE Media Group in a central London venue, was a resounding success, bringing together over 90 delegates from 16 nations to discuss critical safety topics. This annual event aims to improve safety standards, ultimately saving lives and preserving operational capabilities.

The 2-day event was hosted by the RAF Safety Centre Flight Safety Team, headed by Air Cdre Sam Sansome and Group Captain Andrew Keith.

Amongst the UK speakers, Air Vice-Marshal Alan Gillespie (DMAA) talked about 'Enabling Future Capability' which included high-risk Air Systems. Air Vice-Marshal Mark Flewin (AOC 1Gp) discussed the 'coordination of 1 Gp Operations', including measuring safety across the RAF's fast-jet and ISR assets; evolving the RAF's fast-jet training and safety standards; and managing near air collisions for future operations.

There was an impressive array of senior Safety Officers presenting from: Portugal, Australia, Italy, Sweden, Latvia, the USA, NATO and EUROCAE. Leonardo Helicopters UK and Robin Radar Systems delivered from Industry. The leader of SAE Media Group, Tom Ter Haar said: "We eagerly look forward to welcoming the delegation back for the 2024 event next October confident that, together, we can continue to make a significant impact on aviation safety."

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Image: Air Cdre Sansome hosts the 2023 DASC



Image: Panel Discussion led by Air Cdre Sansome

# Civil Insights From the UK Flight Safety Committee

## Trust and Technology

By Air Cdre Dai Whittingham (Retd), Chief Executive

The arrival of new technology is not a particularly uncommon event for military aviation, even if some of it seems to take a very long time to appear. The one thread running through all programmes is that procurement is aimed at a competitive advantage which, in the combat space, is a good thing. For commercial aviation though, that competitive advantage is focused on the financial bottom line, on the shareholders rather than the people who will be physically at risk. That variation in aim can bring a very different dimension to your view of why you have new technology and what it means for you personally; in the commercial world, it typically leads to change resistance.

As inertial (and later space-based) navigation systems began to come on stream in the 1960s, it did not take long for the navigators who had previously done the work to be made redundant and they had largely disappeared from the workforce by the early 80s. Similarly, the commercial flight engineer was soon engineered out of the flight deck as systems became increasingly automated. For business managers, this was a welcome saving in the cost of operations but for the flying community it meant job losses and a significant limitation on developmental routes for the front two seats. Not surprisingly, the unions did not like it.

Let's not be shy here about the Service which, like all armed forces, must balance capability and associated manpower costs. Why should you pay to train and retain someone to do a job that could be done more reliably and more cheaply by the equivalent box? Resources are always constrained, but most might agree 'the system' does its best to deliver the best it can within the confines of its budget,

based on a requirements capture and management process that is driven by people with direct operational experience.

The fact that it is your colleagues who are going on your behalf to bat for a new widget or to argue for a new platform, and not some faceless business manager with no experience of the operation, builds an element of trust that is not matched in the commercial world. There, new technology can be viewed with suspicion, as initiatives can lead to unwelcome trade-offs – for example, a new system to deliver operational flight plans might come with a 5-minute reduction in the time between reporting and pushback (which means potentially employing fewer crew members), rather than 'we've made things easier for you'.

Air Clues Issue 35 touched on Extended Minimum Crew Operations (eMCO) and the rapid progress of advanced air mobility concepts. Regulators are now starting to tease out the difference between eMCO and Single Pilot Operations (SiPO), which are different animals, albeit united in their opposition from pilot unions across the globe. However, the market pressures are building even faster. There are regional airliners on the ground in the USA because the crews are not available to fly them. Of significance is recent advertising for Direct-Entry Captain (DEC) positions in the USA, which is almost unprecedented. Why is it significant? Quite simply because the internal promotion flow is not working as expected.

A knee-pad brief on civil aviation entry might help here. The first filter is not an AFCO interview but the size of your wallet – you need access to £120-150K for training and a licence, which is a lot if you have just left school or college and you lack wealthy relatives. As with any form of training, there are no guarantees of success, so you can be left with the debt and no licence and hence job to pay for it or, as some unlucky people discovered this Spring, your approved training organisation goes into administration and you are left with the debt, no training and no licence either.

Once you get yourself into an airline, you enter the wilds of the seniority system because, in general terms, commercial aviation is time- and not merit-based. Depending on the airline, you can spend many years in the right-hand seat before it is your turn to have a crack at upgrading to captain. As you rise up the seniority list as a first officer, you will be given an increasing amount of choice about the duties for which you are rostered (routes and times). Similarly, as a captain. Except that, even though you are senior to the first officers, you aren't senior to other captains and are back at the bottom of the choice pile with only your (sometimes) enormous salary to console you.

Lifestyle choices are one of the factors leading people to elect to remain as first officers for the rest of their career, which is leading to a shortage of pilots qualified to fly as captain, which is in turn leading to airlines offering DEC slots. With wellbeing becoming more of a focus, you can perhaps understand why some chose to remain as a comparatively big fish in a small pond, especially if the remuneration is enough to meet their needs. But what does that say about professionalism and the drive for excellence, or about continuous improvement?

On the DEC theme, depending on the airline and its labour agreements, it does not necessarily mean a pilot with 10 years seniority in the left-hand seat will slot in at the 10-year point, thereby pushing longer-serving employees down the list. Labour agreements between company and union can be extremely detailed, an example for a large US carrier running to several hundred pages: salary scales broken down to months in role; hotel and vehicle specifications; rest time and leave; allowances and supplements for holiday periods; etc. etc. It makes JSP 752 look simple.

Local politics also come into play. It is not unknown for seniority lists to work differently for those from the host nation, so you can have an expat with 5000 hrs experience in command of a B777 flying as first officer for a captain with limited experience but possessed of the right genes or contacts, who has managed to secure a command upgrade and who needs constant 'minding'. That is a difficult furrow to plough by any standard.

Lastly comes the attitudes to proposed extensions to mandatory retirement ages, currently age 65 for most nations regardless of medical fitness, as a means of expanding the available pool of skilled crews. Many unions are implacably set against change, even for allowing single pilot ops beyond age 60 (which is when air ambulance pilots have to stop). Safety is waved as the primary argument – there is indeed an increasing incidence of incapacitation or cognitive decline beyond 65 – but the counter argument is based on self-interest and the perception that some of those arguing against change simply want to access their retirement benefits and do not want to work longer.

The arguments can be intractable, but trust remains a central element of progress in any change programme. People need to be comfortable that change is aimed at increasing efficiency or promoting growth, but not at their expense. And it is not only trust in the motive behind a new piece of technology, there also needs to be trust in the technology itself. Look at your elderly relatives and the reluctance of many to commit to internet banking – it's because they don't trust it.

SiPO, eMCO, urban or advanced air mobility or whatever, there is apparently a deal of mistrust and possibly misunderstandings amongst the current commercial cohort about where technology is taking them and what it means for their profession. Those of you involved with RPAS will be very comfortable with remote ops, whereas others will be more cautious. Your children may be aware that they might be taking on additional risk by boarding an autonomous platform 10 years from now; your grandchildren won't even give it a second thought.

# Canada's Dirty Dozen Common Causes of Flight Safety Incidents

By Col (Retd) Steve Charpentier Director of Flight Safety (Prevention) National Defence / Government of Canada

Everyone in aviation must have heard about the "Dirty Dozen." If you haven't, it first referred to a blockbuster 1967 American film about 12 renegades conducting an essential sabotage mission behind enemy lines during WW2. The term also refers to 12 of the most common human factors behind accidents or incidents in aviation maintenance. The concept was developed by Gordon DuPont in 1993, while he was working for Transport Canada. It developed into part of an elementary training program for Human Performance in Maintenance. These 12 elements are the root cause of mistakes and have since become a cornerstone of Human Factors in Maintenance training courses worldwide.

Although there are more than 12 human factors to explain common mistakes and errors, I have kept with the title "Dirty Dozen" but expanded past aviation maintenance. Several "Dirty Dozen" concepts can be extracted for different aviation groups including but not limited to ground crew, aircrew, logistical support, and air traffic controllers. In this article, I am focusing on the last decade of RCAF investigations and list the commonalities for both ground crew and aircrew. Let's just say that my take on the RCAF Dirty Dozen is a method to encourage an open dialogue concerning human factors in order to increase awareness, diminish their influence and ultimately prevent accident reoccurrence. Here is my list and suggested countermeasures based on several discussions during annual visits, various research, RCAF investigations, and reports.

I

## Communication

Failure to transmit, receive, or provide enough information to complete a task. Only 30% of verbal communication is received and understood by either side in a conversation. The majority of absorption occurs during the first and last part of a conversation. Be clear and concise. Repeat and summarize at the end what is expected. Make certain the task is understood. Use checklists and adequate verbal procedures. Never assume anything.

II

## Distraction

Anything that draws your attention away from your current task. Distraction is the number one cause of forgetting steps: Use checklists. Ensure technicians/aircrew are not disturbed by establishing distraction-free zones in critical areas. Turn off personal wireless devices. If disturbed, follow the 3-steps back process when returning to task.

III

## Complacency

A general lack of vigilance and loss of awareness to potential dangers that appear during routine activities perceived as risk-free. Too few challenges, repetitive tasks and over confidence can result in boredom and complacency: For maintainers, always expect to find faults! For aircrew, ask yourself: "what should I be doing to improve this flight, what am I possibly missing, what are my next steps?" Avoid working from memory and assuming that something is OK when you haven't confirmed it. Challenge yourself to stay vigilant.

IV

## Ineffective Supervision

Ineffective supervision is the latent root cause of multiple cascading effects that lead to human factors mishaps. It can be related to inadequate planning, poor risk management and failure to monitor and correct unsafe practices: Lead, communicate and "walk the talk." Ensure risk is known and managed at the right level. Trust but verify work execution. Plan adequately and control external pressures.

V

## Lack of Knowledge

Aircraft systems are so integrated and complex that it is nearly impossible to perform tasks without substantial technical training, current relevant experience and accurate reference documentation. Furthermore, systems and procedures can change frequently and employees' knowledge can quickly become out-of-date: Continue seeking professional development. Never make assumptions. Ask when you don't know. Always refer to checklists and publications.

VI

## Pressure

Pressure is to be expected in the military environment. It may be direct, or indirect pressure from the organization, colleagues or ourselves. Supervisors have a key role to shield technicians and aircrew from external pressure: Learn to communicate your concerns. Take the time to do the task right. Be aware of your limits, ask for help. Leave the time stressors to the supervisor.

VII

## Stress

A physical, chemical, or emotional factor that causes physical or mental tension. It can be acute and chronic. Learn to recognize and manage stress before it affects you: Discuss and rationalize your thoughts. Take short breaks when needed. Practice breathing and relaxation techniques. Seek help to manage chronic stress.

VIII

## Fatigue

Physical or mental exhaustion due to prolonged physical activities and/or mental stress. Fatigue impacts our ability to concentrate, remember and make decisions. Studies show that being awake for 24 hours is the equivalent of having .08 alcohol blood level. It is a proven fact that we tend to underestimate our level of fatigue and overestimate our ability to cope with it: Watch for symptoms of fatigue in yourself and others. Have others check your work? Get adequate rest. If chronic, seek medical help.

IX

## Not Taking Ownership

We need to take full ownership of our work and the work of others; Tasks, operations and Flight Safety are team efforts. We are all responsible for the safe outcomes of all tasks. It is the "not my job" attitude that opens the door to incidents and accidents: Understand your job and the jobs of others. Ask if unsure about your work or the work of others. Report any safety concerns.

X

## Over Confidence

A safe "can do" attitude is desired in any military, but over confidence in our abilities has triggered multiple incidents and accidents in aviation: Don't gamble with your task execution. Know your limits and ask for help.

XI

## Task Perception

The task could be perceived as being so important as to disregard procedures, cut corners and take unjustified risks. The more a task is perceived to be important coupled with operational timeline pressures, the more it leads to procedural deviation: Be realistic about your task. Focus on your work, not on the timeline.

XII

## Lack of Situational Awareness

For pilots, spatial disorientation has caused at least four catastrophic accidents in the RCAF in the last 20 years and possibly more incidents related to depth perception during autorotation and landing. For ATC, lack of situational awareness can lead to airspace violations and near/mid-air collisions. For ground crew, there are several towing events related to confusion and loss of situational awareness: Reinforce aeromedical training. Trust your instruments. Understand and follow policies and procedures needed to complete a task. Learn to see the big picture and predict the possible results. If it doesn't feel right, take action to remove your concern.

# Doc's Corner: "Break-Off" ... Hanging onto the wing tip

By Dr Vanessa Garnelo-Rey, Medical Officer Instructor, RAFCAM



Image: 'Break-Off': copyright ©2023 Paula Garnelo-Rey. Reproduced by kind permission

*"I was flying a high-level transit from Germany to the UK (FL 210). I was flying in thin cirrus over the North Sea, nobody was talking to me on the radio and all I had to do was monitor the instruments. I suddenly became aware that I appeared to be looking at myself from behind the back of my head and that I could not remember what had been going on over the last couple of minutes. I did not know what was happening, my body pumped about a gallon of adrenaline into my bloodstream and the throttle never left the left-hand corner for the remainder of the sortie. I landed, considerably shaken, thinking that I had experienced some kind of fit and that if I went to see the doctor, I might be grounded."*

*"I was bored and daydreaming, staring out of the window of the flight deck during a long flight. I had a not unpleasant feeling of detachment followed by a more unpleasant feeling of the aircraft flying on a knife edge, that it was balanced finely in the sky. It was unsettling but I was aware that it was caused by under-arousal and that all I had to do to get rid of it was do something (flight deck tasks and engaging other crew members in conversation)"*

*While in a left-hand climbing turn, the pilot bent his head down and to the right to find the radio compass audio switch, and he experienced violent vertigo. Upon attempting to level the wings: "I experienced extreme control stiffness and found that even using both hands and both knees I could not move the control column to the right... It felt as though a giant hand was thrusting the stick to the left"*

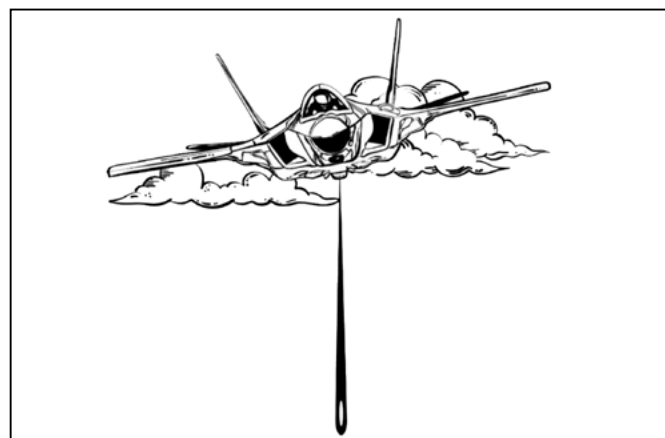


Image: 'Knife-Edge': copyright ©2023 Paula Garnelo-Rey. Reproduced by kind permission



Image: 'Giant Hand': copyright ©2023 Paula Garnelo-Rey. Reproduced by kind permission

## Other common aircrew descriptions:

*"My aircraft was suspended in space on the point of a needle"*

*"It seems so peaceful; it seems like you are in another world"*

*"I feel like a giant; I feel something like a king"*

Have you ever experienced a similar episode at any point in your flying career? If so, did you talk to anyone about it? Had you heard about these episodes before?

They are called **aviation dissociative phenomena** usually known as **"break-off"**, a **"giant hand"** controlling the aircraft or a feeling that the aircraft is finely balanced on a **"knife edge"** from which it might fall. There may be other experiences that form part of these phenomena. For some these are mild and for others much more pronounced.

One of the very first episodes of **"break-off"** was described in the 1950s. It involved a fast jet pilot flying a high transit in clear weather and in a relatively quiet phase of the flight. He reported feeling "detached" from the Earth and from the aircraft, an intense sensation of remoteness and loneliness, and feeling closer to God. He described it as a not unpleasant experience but a rather exhilarating one.

For many years, these phenomena were thought to be exclusive of fast jet pilots flying high altitude transits. The pilots' mind wandered due to the lack of stimulation. Sensory constancy (ie "nothing happening") and boredom were often described as potential triggers.

However, further cases were reported involving not only pilots, but also other aircrew flying different platforms, and not just at high altitude.

A 2002 USAF Spatial Disorientation Survey reported 38.4% pilots described at least one episode of **"Giant Hand"** with the highest proportion in Rotary Wing platforms 55.4%, closely followed by Fast Jet 40.8%. 10.8% pilots described at least one episode of **"detachment"** with the highest proportion in multi-engine platforms (13.5%) followed by Rotary Wing platforms (11.9%).

Under-arousal, low workload, and fatigue seem to be strong triggers for these phenomena, and the crucial element here is whether flight safety is compromised. There have been reports of distraction and degraded performance due to anxiety and hyperventilation, but the lack of reporting makes flight safety assessment a difficult task.

It is important to highlight that, for many individuals, the episodes may not take the well-known form of an **'out-of-the-body experience'**. Fostering corporate knowledge and promoting reporting can help us understand the true incidence of these phenomena. Aircrew who find the experience pleasant or exhilarating tend not to report it, as they see no reason to, but the downside is the lack of knowledge among fellow aircrew and the medical community, and the difficulty in estimating true incidence

Coping strategies and preventative measures can be learnt so the loss of valuable and highly-trained personnel can be averted.

Experiencing one or several of these episodes may become unduly distressing or trigger panic attacks, flying phobia or an anxiety disorder. Discussing them at an early stage with your MO is your best ally to prevent potentially serious clinical problems later. One of the reasons why, for many years, these episodes were thought to be pathological was mainly due to aircrew presenting to their doctor too late, when a serious clinical problem had already developed. The biggest factor in successful outcomes is early reporting.

We need to consider talking about these experiences freely to take away the mystique, both amongst colleagues, and with your medical officer. They are a part of the psychological and physical responses to flight, and we should "normalise" discussion about them.

We all experience mild versions of dissociative phenomena in our daily life in the form of **"daydreaming"**.

**How many times have you driven your car to a place, and you cannot remember how you got there or cannot recall part of the journey?**

It does not mean driving safety was compromised; you were simply driving on "autopilot".

Other forms of spatial disorientation can be present at the time of these phenomena occurring, but this is not essential.

Flying experience does not make you immune; however, your state of health, malfunction of the aircraft, or a long lay-off period, can increase the risk of experiencing any of these episodes.

**Flying scenarios where aircrew have experienced aviation dissociative phenomena:**

- High altitude transits
- Low altitude
- Poor instrumentation
- Cross-country flights
- Training flights
- Night flights
- Instrument flying
- Horizon poorly defined
- Featureless terrains (sea, snow, dust/sand)
- High cockpit workload

**How have aircrew dealt with these episodes?**

- Returning to lower altitude.
- Joining up with another aircraft in formation.
- Voluntary effort to become interested in some problem or activity associated with the flight.
- Concentrating on the attitude indicator.
- Transferring control to another crew member.
- Breaking out of formation.
- Holding controls with thumb and index fingers (in the case of the giant hand illusion).

From the last survey conducted in 2001 which specifically addressed these phenomena, the overwhelming message from aircrew was the need for:

**EDUCATION!**

In the words of a Jaguar pilot (Air Clues May 1985):

“Understanding is a wonderful way of overcoming fear, so I would advise all pilots who attend the aviation medical training course to try and concentrate through the after-effects of Ruddles and listen to what the Docs say”.

**Doc’s Advice**

- The best strategy is prevention. Keep your brain busy!
- Learn useful coping strategies described by fellow aircrew or create your own.
- Share your experience with your peers.
- Talking about it helps you relieve apprehension.
- Report it. Corporate knowledge goes a long way in mitigating potential distress caused.
- Use anonymised surveys to describe your experience/s, such as the next MOD Disorientation Incident survey in January 2024.

“ Knowledge itself is power ”

(Sir Francis Bacon Meditations Sacrae 1597)

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# Air Sense Extracts – Pamphlet 122

Issued by the Directorate of Flying training, Air Ministry, Jan 1942

The RAF Safety Centre was given a few copies of wartime (WW2) Air Ministry Pamphlets for Engineers and Aircrew. These contain a diverse array of narratives that we though you might find interesting, not least because of the way things were presented back then. Here is an extract from Pamphlet 122, dated Jan 1942.



## PAMPHLETS FOR ENGINEERS AND AIRCREW

(Prepared by the Air Ministry)

### Preventable Accidents

In the early days of flying, unreliable engines and aircraft that broke up in the air under unaccustomed stress provided a heavy toll of accidents. Today, aircraft are of stout construction and engines are reliable. But the toll of accidents still continues because the 'human element' is provided with greatly increased scope to commit errors. Approximately seventy percent of all accidents are caused by pilots' errors; and the large majority of these accidents are due to lack of method in applying the ancillary controls and slack habits acquired on simple elementary aircraft.

To manufacture and operate training aircraft makes a heavy demand on our national resources, yet directly adds nothing to our striking power against the enemy. It is therefore imperative that everything possible should be done to prevent any avoidable increase of this burden.

When a training aircraft is put out of commission, an expensively trained and valuable air crew may go out of commission with it. Flying accidents and injuries have a habit of accompanying each other. The aircraft itself then has to be repaired or replaced; this calls on men, machinery, factory space, material and time that could all be employed more profitably in the manufacture of front-line types. Hundreds of avoidable accidents each month clearly constitute a very serious setback to the national effort.

There is one other side to preventable accidents worth considering – the chagrin and sense of futility experienced by all concerned with paying for and building aircraft when they see a brand new aircraft smashed up through neglect, carelessness, lack of method, 'showing off', or similar causes. Moreover, the cost of many of them has been voluntarily subscribed by poor people; one bomber alone may represent the sixpences and shillings of half a million such men and women.

### Method Means Efficiency

Light aircraft have few controls to promote thought and in them one therefore develops what may be described as a 'happy go lucky' attitude towards flying. This will not do for advanced training and operational types. Unless abandoned early, it will lead to inevitable disaster. The pilot has no need to go around worrying that at any moment he may pull the wrong lever and send himself and his aircraft spinning into the ground. But he must realise clearly that faced with a multiplicity of controls, and the speed and smoothness with which these must sometimes be operated, he must train himself to eliminate hurry, to use method in all that he does, and to think systematically.

# The Cold Blue

## Flight and the Contrail: a recurring, frosty relationship

By Captain Robin Evans - pilot and member, BALPA Environmental Study Group



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Higher and higher, climbing to reach best operational altitude. Five miles straight up, temperature 40 degrees below zero, into the lifeless stratosphere. Until the exhaust of the engines mixing with the cold, thin air condenses and streams the heavens with vapour trails. To the men in the ships they are far from beautiful, for they point like sign posts in the sky for the enemy to spot us.

So runs a scene from the 1944 war documentary *The Memphis Belle: A Story of a Flying Fortress*, the grittier truth upon which the 1990 Hollywood fiction was based. The earliest observations of contrails, perhaps inevitably, date back to around the First World War. These soon turned to suggestions of formation by the mixing effect of wake

or linkage with exhaust gases and condensation. In June 1921, the journal of the American Meteorological Society published a discussion of the phenomenon with eyewitness testimony from the Western Front at Argonne, France in 1918.

Conflicts come and go, but who might have imagined, a century on from their first mention, that contrails would be considered equally undesirable - for an entirely different reason? To us, they're characteristic of early morning, criss-crossed skies. They have both wonder and use: the brief, churning passage of fellow professionals or a visual guide to offset from the wake of a heavy as you climb through its level. But they have a darker side.

We all know about the effects of aviation carbon emissions, but did you know that contrails are now understood to have roughly 50% more impact than all of aviation's CO<sub>2</sub> emissions? Two thirds of aviation's contribution to the climate crisis comes from non-CO<sub>2</sub> effects, with contrails by far the biggest factor. [Lee et al, 2021. Total aviation warming effects in 2018 are estimated at 100.9 mWm<sup>-2</sup>. Contrails caused 57.4 mWm<sup>-2</sup> and CO<sub>2</sub> 34.3 mWm<sup>-2</sup>]

### Formation

The various by-products of fossil-fuel combustion engines include CO<sub>2</sub>, oxides of nitrogen, water vapour and fine soot particulates. Crucially, jet engines inject the latter two at high altitude, where the water vapour rapidly condenses and freezes into ice crystals.

In drier air, these crystals dissipate through sublimation (changing phase directly from solid to gas without the intermediate liquid state; the term conventionally only applied the other way). However, in more humid air, the ice crystals persist, and in association with the soot particulates, become nuclei for further condensation, permitting contrails to expand over large areas of sky.

### There are two related myths to dispel:

If contrails seem similar to condensing breath on cold mornings, there is a key difference – they only form in the extreme cold of high altitude, natural cloud forming down to ground level. Condensing breath disappears within seconds, but frozen contrails only disappear as they gradually sublimate, their persistence key to the threat they pose.

Consider the last time you watched landing or departing traffic. Possibly you witnessed condensation briefly forming around a propeller, above a wing or within an intake, caused by the localised pressure drop experienced in these areas. This is the 'aerodynamic contrail' - an entirely different, and again transient, phenomenon.

### Classification

Published by the World Meteorological Organisation, *The International Cloud Atlas* is the worldwide scientific reference for the classification of clouds and weather phenomena. First published in 1896, it recognised that clouds were consistent evidence of weather patterns.

A 2017 update made twelve additions – either entirely new types or variations of existing classifications.

Included were homogenitus (clouds formed by human activity) and homomutatus (homogenitus evolving into persistent cloud) the prefix homo- referring to humankind. Contrails are classic homogenitus; the condensation nuclei of ship's trails, forest fires or industrial pollution are other sources.

However, homomutatus is the greater threat, causing 90% of the atmospheric warming associated with contrails. These are persistent contrails that mutate into cloud (called contrail cirrus or aviation-induced cloudiness - AIC) often with the influence of upper winds. The cause of their persistence can be remembered by: dry-dissipate/moist-maintain. This is a matter of altitude, temperature and relative humidity, a relationship defined in the Appleman Chart, devised in 1953 by meteorological scientist H. Appleman.

### Reflection and radiation

Albedo (from the latin for white, albus) is an object's index of reflectivity – of light and therefore also heat. The more reflective a surface, the higher the albedo; fresh snow has a very high albedo, surfaces like concrete or vegetation are much lower. Scientists refer to albedo on both surface-specific and wider regional scales, considering cloud cover and the scattering effect of atmospheric particles.

Ice coverage towards the Poles is a classic example. On bright days, sea ice will typically reflect 90% of incoming solar radiation, with only the minority absorbed. With sufficient temperature rise, surface meltwater will appear, significantly lowering albedo: absorption and reflection equalise. Without any ice, water now reflects the minority, instead absorbing 90%. Loss of Polar sea ice is understood as a vicious feedback loop in itself, contributing to global temperature rise.

The contribution of AIC occurs due to the interaction of two opposing, daily factors. During daytime, AIC reflects incoming solar radiation and absorbs outgoing infrared long-waves radiated by the earth: this can have a cooling effect, blocking direct heat from the sun. By night, the incoming solar component drops to zero but the trapping of outgoing radiated heat from the earth continues. Though this may suggest the two effects cancel each other out, the trapping of radiation by night outweighs the reflective cooling by day: the net effect is overwhelmingly one of warming.

Therefore, contrails formed after late afternoon (the threshold commonly used is 4pm) have greatest potential to trap heat overnight - consider the effect of cloud cover upon nightly temperatures in general. This blanketing effect is known as Cirrus Radiative Forcing, directly linked



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to the Greenhouse Effect. Aviation makes up roughly 2.4% of global human CO<sub>2</sub> emissions but when non-CO<sub>2</sub> effects are included, contributed 3.5% to overall warming impact (2011 data).

### Trialling

An Imperial College study (Stettler et al, 2020) of Japanese air traffic found that 2.2% of flights caused 80% of radiative forcing. Therefore, targeting a small proportion of flights could yield disproportionately great benefits. The same study suggested that altering the path of 1.7% of flights would achieve a contrail reduction of 59% for a sub-1% increase in fuel burn - but a net positive climate effect.

Testing this in practice came to Europe in 2021 in the following Notam. MAASTRICHT UAC (EDYY) AIRSPACE. IN AN EFFORT TO MINIMISE THE IMPACT OF AVIATION ON THE ENVIRONMENT, MUAC WILL BE RUNNING A CONTRAIL PREVENTION TRIAL FROM 18 JAN UNTIL 31 DEC 2021 BETWEEN 1500-0500UTC.

Seizing upon the current traffic downturn, the trial was a world-first, sector-specific study of our ability to reduce persistent contrails and therefore contrail cirrus. Daily weather and traffic conditions were assessed, looking at afternoon and overnight flights through ice-supersaturated regions (ISSRs) occurring around FL300 (winter) and FL360 (summer). Traffic permitting, the trial aimed to offer the next most effective level, respecting fuel and safety concerns, not applicable to climbs through the affected altitudes.

The German Aerospace Centre (DLR) used satellite imagery for post-flight validation. The DLR previously made the airborne validations of Airbus' volcanic ash sensing trials, one of many projects into airborne climate science. "This demonstration will show which practical difficulties have to be overcome if we are to implement ATM procedures to reduce the climate impact of aviation, and whether today's meteorological tools are good enough at forecasting areas where persistent contrails tend to form, and which should be thus avoided," says DLR Professor Robert Sausen.

The project was interested in our ability to forecast ISSRs and predict contrails as much as our influence on mitigating them: evolving meteorological modeling and space-based imaging alongside airspace management. This begins to explore optimum flight profiles for their net climate, rather than purely fuel-based efficiency: current data suggests that 'climate optimisation' could save up to 168t of CO<sub>2</sub> equivalent per affected flight.

Meanwhile, Cambridge-based data analytics company SATAVIA has put contrail prevention into practice in commercial flight operations. In October 2021, SATAVIA partnered with Etihad and Boeing on a world-first – deploying contrail prevention alongside other innovations for the first time on a commercial flight, cutting overall per-flight climate impact by 72 per cent compared to 2019 levels.

By optimising Etihad's original flight plan for contrail avoidance, SATAVIA eliminated 64 tonnes of carbon



Source <https://www.af.mil/News/Photos/igphoto/2000407450/> Image is declared Public Domain

dioxide equivalent (CO<sub>2</sub>e) at a penalty of 100kg additional fuel burn – equivalent to one extra passenger and their baggage. Alongside measures such as optimised climb/descent profiles, SATAVIA's technology expands the art of the possible for sustainable flight.

The Maastricht Trial Paper can be seen at this link: [https://nari.arc.nasa.gov/sites/default/files/attachments/NielsLokman\\_Contrail%20PDF%20Slides.pdf](https://nari.arc.nasa.gov/sites/default/files/attachments/NielsLokman_Contrail%20PDF%20Slides.pdf). In summary, the trial concluded that: Contrail prevention is operationally possible; it's too early to propose indicators or to set targets on non-CO<sub>2</sub> emissions (prediction and detection need to improve); and, unsurprisingly, more research is necessary.

### Easy wins

Predictions of industry growth using current technology will only increase aviation's contribution. Replacing jet fuel or manufacturing new aircraft will be lengthy, difficult and expensive challenges. Hydrogen fuel cells may be

zero-carbon, but will still emit water vapour; combusting hydrogen will also still produce undesirable nitrous oxides. However, adjusting flight levels to reduce our time in conditions where contrails form and persist has the potential to vastly reduce the environmental impact of aviation quickly, with low associated costs.

Despite their recurring popularity in a variety of myths, it is now understood that contrails are no con. Avoiding them was historically a military consideration, only now spilling into the civilian world for an entirely different reason. Airline flight began in the UK in the aftermath of World War One. Just over a century on, the contrail is a priority target in our very different battle for the skies.

Originally published in 'The Log Yearbook 2023'. Reproduced by kind permission. Commercial pilot and freelance writer Robin Evans (Twitter/X @robkievans) is a former environmental consultant.

# Royal Air Force BikeSafe Workshops Continue

By the RAF Safety Centre



The RAF is continuing with the highly successful BikeSafe initiative that has previously proved very popular with our motorcycling personnel. Air Support A4 MT has been awarded internal funding to facilitate subsidised BikeSafe workshops across the TLB through to Financial Year 2024/25.

BikeSafe is a National Police run motorcycle initiative, aimed at working with motorcyclists in a relaxed environment to raise awareness of the importance and value of progressing on to accredited post-test training. The workshops have been endorsed by the Chief of the Air Staff in conjunction with the RAF Road Safety Strategy to help mitigate the Risk to Life from Road Traffic Collisions which continues to be a habitual killer within the RAF.

The national BikeSafe scheme has been identified as a key mitigation measure to help to reduce motorcycle fatalities. The RAF workshops involve an observed ride with an advanced Police motorcyclist or approved BikeSafe Observer. With some local variation, the workshops aim to cover rider attitude, systematic methods, collision causes, cornering, positioning, overtaking, braking, hazard perception and use of gears.

## Who is it For and is it free?

To provide geographical availability, BikeSafe offers eligible riders the opportunity to attend regionally facilitated workshops at no cost which are delivered via 36 Police Forces across the UK and Northern Ireland (currently unavailable in

Scotland, A4 MT are investigating a similar initiative for this region of the UK in 2024). Air funded BikeSafe workshops are available to all RAF (Regular & Reserve) personnel. In addition, the following personnel are eligible to attend:

- Military personnel (Regular & Reserve) assigned to Air TLB JPANs.
- Civil Servants (CS) employed within the Air TLB.
- Air employed Contractors (e.g. HADES, LAFT, Babcock, Serco & Landmark).

## Further Information and How to Book Workshops

A total of 130 workshops have been funded for this FY. Entitled riders can attend a public, or private workshop at zero cost. So long as you are eligible, you can book either a public or private event directly online via the RAF BikeSafe website ([bikesafe.co.uk/raf](https://bikesafe.co.uk/raf)) by using the e-voucher code (RAF-003-2023 (all eligible personnel)) where prompted. Unit supported Group workshops are available at most Air establishments. To check availability, interested parties should contact the Air Support – A4 MT Command Master Driver via email at [Air-Support-A4 MT](mailto:Air-Support-A4 MT).

# Wind Chill ... Can catch you out.

Make sure you're wearing adequate cold weather clothing

... BEFORE you start work.



# Snowbirds Accident 2022

By the RAF Safety Centre



The accident aircraft was initially one of the nine Snowbirds stationed in Fort St. John airport in support of the Fort St. John International Air Show, on July 30-31st 2022. Two days after the air show, the aircraft was to be ferried from Fort St. John back to Moose Jaw, SK, on a standard IFR transit flight. There was a single occupant onboard and the aircraft was not in formation.

On the morning of the accident, the pilot conducted a routine series of pre-flight checks before proceeding to the active runway for a standard departure. Shortly after lift-off, the pilot confirmed a positive rate of climb and selected the landing gear up. Immediately after gear selection, the pilot heard a loud noise and the engine failed. The aircraft rapidly started decelerating and descending back to the runway. The pilot selected the landing gear back down and elected to land the aircraft straight ahead, however the landing gear did not have sufficient time to fully cycle back to the locked-down position. The aircraft touched down with only approximately 500 feet of runway remaining.

The unlocked landing gear collapsed under the weight of the aircraft, and the aircraft skidded off the departure end. After approximately 1000 feet of travel, the aircraft impacted the airport perimeter fence at low speed and came to rest. The pilot secured the engine and immediately egressed the aircraft.

The aircraft sustained very serious damage but the pilot sustained no injuries.

The engine failure was due to an improperly assembled oil filter. The investigation is now analysing the human factors that may have contributed to this occurrence.

The type of seat used in the Tutor is not the zero/zero type, so an ejection under low speed/low altitude condition could have been risky. In 2020 Canada lost a member from a low level ejection on the same type of aircraft.

Capita Fire and Rescue

## It only takes an accident to start a kitchen fire



**Fires that involve cooking account for nearly half of all accidental fires on MOD estates.**

- Keep tea towels and cloths away from the cooker and hob
- Double check the timer is working
- Never leave cooking unattended
- Ensure electrical appliances are PAT tested
- Only use approved cooking appliances
- Take care when cooking with hot oil – it sets alight easily
- Never drink alcohol and cook
- Ensure the kitchen door remains closed.

**What to do if a pan catches fire: Don't take any risks. Turn off the heat if it is safe to do so. Never throw water over it. Don't tackle the fire yourself. Get Out. Stay Out. Call base emergency number!**

### Barbecues

- Do not drink alcohol if you oversee the barbecue or any cooking!
- Make sure your barbecue is in an agreed area
- Never use a barbecue indoors. Keep a bucket of water, or sand nearby
- Follow the safety instructions provided with disposable barbecues. Never use petrol or paraffin to start or revive your barbecue
- Do not empty into dustbins or wheelie bins.

Capita





# Actions to Stay Protected from the Cold this Winter

By the RAF Safety Centre



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During the winter period, whether on deployed operations or whether completing routine tasks at home, to stay alert and effective, you need to stay warm. Do not underestimate the debilitating effect of cold weather which can be a hazard to your health and your ability to do your job properly.

## Understanding the Risk – Heat Loss through Convection

If you are inactive for a period of time in cold weather, your core body temperature may start to drop. Your skin acts like a radiator and warms the air in between the layers of clothing you are wearing. If you allow the skin to be exposed to the environment, then heat will be lost to the air. Your head, neck and wrists are particularly vulnerable to heat loss to the environment. If the air next to the exposed skin is continually replaced by more cold air i.e. on a windy day, then the heat loss through this 'convection' is exacerbated. That's why a windy day feels colder than a still-air day with the same outside air temperature. The windier it is, the more you will lose heat. Wearing a windproof outer layer reduces heat loss through convection. In addition to a thick layer of clothing for the body, for those vulnerable areas, a hat, scarf and gloves will help protect you.

## Understanding the Risk – Heat Loss through Radiation

Direct contact with a cold surface will draw heat from the body. In other words, touch something cold and your body will attempt to warm that object up using your own body heat through convection. Metallic objects and water are extremely good conductors of heat and will draw it more quickly. If you are immersed in water, particularly moving water (just like the wind!) or if you are wet through to the skin, you will lose heat very rapidly. You must get changed into dry clothing quickly. Best of all, don't get wet in the first place – wear a waterproof outer layer.

## Understanding the Risk – Heat Loss through Evaporation

Working hard will make you sweat, because you are generating core heat. Sweating is your body's way to cool down your core temperature. But, have you noticed that you

sweat even when it is cold outside? As the sweat evaporates from your skin, it takes heat out of your body. And if it is windy, this will increase the rate of evaporation (which is why you fan yourself to keep cool). So, if you have damp skin, and you are not wearing windproof clothing, you will lose heat very quickly, especially in cold weather.

Drawing all of the above together, you can see that if you remain still/inactive, such as holding a static position (e.g. guard duty) or if you have damp clothing, and it is a cold windy day, you are at a much higher risk of cold injury.

## Simple Steps to Prevent Heat Loss

Wear the correct clothing and carry spares – especially, gloves which can get wet very easily as you handle things. Gaiters are often overlooked, but can keep you drier and warmer. Layer up, and wear a windproof, waterproof outer shell. Put these on before you become exposed to rain or snow, not just when you are already cold and wet. Replace wet clothes with dry clothes as soon as possible. Keep your stash of spare dry clothes in a dry area. If you are in prolonged static position, insulate your feet from the ground if possible. Make sure your footwear, preferably boots, are snug fitting but not too tight. If your socks get wet, change them immediately.

Some medical conditions and medications increase cold injury risk. Let your medical officer know if you suffer symptoms in the cold. Avoid alcohol 24 hours before any activity where cold injury is a risk. If you are undergoing training and you are suffering cold injury symptoms even after trying re-warming actions, you must report this. If caught early it is possible to recover quickly.

## Remember the Acronym – COLD FEET

Keep it **C**lean. Dirty clothing tends to be packed down which compromises insulation.

Avoid **O**verheating. Adjust any layers to avoid this.

Wear it **L**oose. Loose layered clothing traps air and provides good insulation.

Keep it **D**ry. Wet clothing leads to rapid heat loss.

**F**it Clothing correctly.

**E**xercise extremities.

**E**at and drink plenty.

**T**ight boots are terrible.

## Understand the Most Common Cold Injuries

When working in cold environments, feeling cold, or numb hands and feet may be normal. Feeling pain in the hands



Defence Imagery Crown Copyright

during re-warming is also normal. But after 30 mins of re-warming, if shivering continues, or pain in the hands remains, or numbness doesn't go away, it might be a sign of cold injury. The main cold injuries are:

- Hypothermia
- Freezing Cold Injuries
- Non-Freezing Cold Injuries

These are all different, and one or more may occur at the same time.

## HYPOTHERMIA

Hypothermia is a lowering of the core body temperature, and occurs when the body is unable to generate or maintain sufficient heat to prevent cooling. This can happen slowly such as when you are wet and cold on a UK exercise. Or, it can happen rapidly, when you find yourself in an extreme environment or if you are immersed in water. Mild signs and symptoms of hypothermia may include some or all of the following:

- A colleague feeling cold or cold to the touch.
- Uncontrolled shivering.
- Mild confusion, disorientation, or irritability.
- Clumsiness, or loss of manual dexterity.

As the core body temperature drops further, moderate or severe signs and symptoms may include:

- Slurred speech.
- Lips turning blue.
- Shivering stops.
- Apathy or confusion.
- Irrational behaviour, such as getting undressed!
- Slow or irregular or undetectable pulse.
- Casualty is unresponsive and may look deceased.



Image: Severe Freezing Cold Injury: Wiki Commons: Dr Harry Gouvas

### FREEZING COLD INJURIES

Freezing Cold Injuries are caused by parts of the body actually freezing when the temperature is below 0°C. It can also be caused by direct contact with a frozen surface. It can cover a range of conditions such as: frostnip, which is relatively minor; or severe freezing affecting deeper tissue and which may lead to amputation. This latter condition cannot be determined in the field by an onlooker. Freezing cold injuries usually affects the extremities, such as the hands or feet, or parts of the exposed face such as the nose, ears and cheeks.

Suspect Freezing Cold Injuries if the affected area of skin is much paler than normal or is white. There will be a clearly visible border between the frozen skin and the unaffected normal-coloured skin. There will be no pain or feeling in the affected area, and it will feel cold and hard to the touch. After re-warming, the affected area may appear blistered or bruised. You cannot judge how severe the injury is by its initial appearance.

### Non-Freezing Cold Injuries

Non-Freezing Cold Injury is the most prevalent cold injury to Service Personnel. It is caused by a gradual, prolonged cooling of the hands and feet – most commonly whilst on Exercise or on Operations in cold wet weather. It leads to damage to the nerves and tissues. You need to inspect your hands and feet regularly. Look for: hands or feet that have been cold or numb for a prolonged period. Look for pain or tingling or swelling that continues for longer than 30 mins after re-warming. Look for any altered sensations after re-warming.

### Treat Cold Injuries to Yourself and Your Colleagues

So long as the casualty is **conscious**, the actions for all cold injuries are the same:

## Prevent further cooling, and re-warm

You can prevent further heat loss by moving the casualty to a shelter to protect them from wind and rain. If no shelter is ready to hand, erect a tent if available or shield them from the elements. Put a layer of insulation under the casualty; replace any wet clothing with something warm and dry; cover the casualty's head and neck.

Once you have prevented any further cooling, you can proceed to warm the casualty up: huddle round to create body heat; give them warm drinks (not alcohol) and energy foods; once they are dry and have had food and have been stable for 30 mins, encourage some gentle exercise; then transfer them to a heated environment where possible.

If the casualty is **unconscious**, and you suspect moderate or severe **hypothermia**: handle them gently, keep them horizontal, and check for vital signs every 60 seconds. If they show no signs of life, call for evacuation, start CPR if safe to do so, and the casualty is not beyond resuscitation. If signs of life reappear, then start your re-warming procedures.

If you suspect moderate or severe **Freezing Cold injury**: handle the frozen part as gently as possible; remove any jewellery from the affected area – making sure you don't cause further injury; and if the affected area is blistered or discoloured, cover with a light field dressing.

Things you **must not do** when treating Freezing Cold Injury:

- Don't try to re-warm the affected area if there is a risk of it re-freezing. This could make the injury much worse.
- Don't apply direct heat.
- Don't rub the frozen area.
- Don't allow the casualty to smoke or consume alcohol.
- Don't apply skin ointments.
- Don't allow the casualty to use the affected limb when re-warmed.

If you are on exercise or operations, there is a Non-Freezing Cold Injury Field Assessment Tool (NFAT) that you should use to determine what to do next. It contains Green, Amber and Red answers to questions to help you to decide what to do next. Make sure this is available to you before you deploy on exercise or on operations.

Everyone is vulnerable to cold injury. Knowing what to do and applying the right skills will help you to keep yourself and others safe.

**Report symptoms which cannot be rectified by initial re-warming.**

**Look out for colleagues.**

**Raise the alarm straight away if you have any concerns.**

**Check hands and feet regularly.**

Cold injury caught early leads to a quick recovery. Check JSP 375 Chapter 42 for an individual's guide to cold injury prevention.

Material for this article was drawn from JSP375 Ch 42 and from the DLE Training Video: Lesson 2 – 'Cold Injury Individual's Guide'.

**Field Assessment Tool (NFAT)**

| Feel Hands and Feet   |                                                                                                                                               | Only continue examination if hands or feet feel cold |                                      |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------|
| HISTORY               | How long have your fingers/toes been so cold that they have no feeling?                                                                       | Less than 60 mins                                    | 60 mins or more                      |
|                       | Have you noticed any burning/tingling/pins and needles or other pain?                                                                         | NO                                                   | YES                                  |
| LOOK                  | Are the fingers/toes a normal colour?                                                                                                         | YES                                                  | NO                                   |
|                       | Can they feel you touching their fingers/toes? (get them to close their eyes while you do this and say 'touch' each time they feel something) | YES                                                  | NO                                   |
| FEEL                  | Does it feel normal to them when you touch them?                                                                                              | YES                                                  | NO                                   |
|                       | Do their fingers/toes rewarm easily in less than 30 mins?                                                                                     | YES                                                  | NO                                   |
| RESPONSE TO TREATMENT | As they rewarm do they notice any burning/tingling/pins and needles or other pain.                                                            | No or lasts less than 30 mins                        | Yes and persists longer than 30 mins |

■ May continue  
■ High index of suspicion; only allow to continue if once warm they have no further symptoms; re-check them regularly.  
■ 2 ambers (that do not resolve on rewarming) or red = NFI until proven otherwise, remove from cold environment and arrange review with doctor.



Image: F-35B Lightning aircraft from RAF Marham waiting to be de-iced at Amari airbase in Estonia. © Defence Imagery

# BASH, Not a Party, But Definitely a Team Sport

By Lieutenant Colonel Mark A. Schmidt, US Air Force, Program Manager, BASH Team

(The views expressed are those of the author and do not reflect the official guidance or position of the Department of Defense or the United States (U.S.) Government.)



Starlings: Source Wiki Commons License: Creative Commons Attribution-Share Alike 4.0 International license. Photo by Leonhard Lenz

When people hear the term BASH, they almost immediately recollect a party, a celebration and good times shared by all. But in the world of aviation, Bird/wildlife Aircraft Strike Hazard (BASH), has an entirely different meaning. BASH is most definitely a participatory event, and honestly, the more the merrier. Invite your colleagues, invite the neighbours, and definitely spread the word around town.

Seriously, any good BASH program requires a total team effort, and that goes for home and away venues. The home airfield should involve a coordinated and integrated approach between the flying community, the airfield management

team, civil engineers, pest management, natural resources, and all the local community members, especially farmers and neighbours with ponds, lakes, rivers, water sources or forested lands. The different teams have their distinct roles and responsibilities, but it involves an integrated effort. Data sharing ensures coordinated effects are achieved when the safety team, or the airfield team, orchestrates the BASH solution set.

Data collection and shared observations are the key. If the airfield management team is diligent in their daily inspections and annotated observations, then that data should be shared

and acted upon by the supporting teams. For instance, weather changes can bring out insects or worms, which will then attract birds and/or small mammals, which can attract larger raptors. Be wary of your weather patterns. Are you experiencing normal weather conditions? Is it a particularly wet spring, dry summer, any out of the ordinary conditions, or sudden changes? Any of these weather events can cause a sudden increase in the number of insects and food sources for birds and wildlife. Resultant effects could mean an increase in BASH risks, and thus mitigation can be achieved with any of the supporting teams.

Pest management could apply sprays or insecticide treatments to problematic areas to reduce the insect biomass. Take a look at the airfield and immediate areas after water events. Standing rain puddles, blocked or restricted drainage ways and the soft, marsh-like soil areas could potentially be trouble spots. Those issues may be eradicated with the civil engineering department, providing earth grading measures to build up low spots and ensure water flows as intended off the airfield. Normal drainage should evacuate all water from the airfield within 48-hours following a water event. Civil engineering is charged with maintaining clean drainage ways, free of debris, man-made or natural build up. Check on drain boxes, drainage ways with little relief that can hinder runoff. These situations may require more than a simple cleaning, the level and grade of the underlying soil structure may need to be altered and updated. Just like old, tired eyes, airfields also get a bit saggy and droopy with age.

Organic materials in the sub-base decay and degrade over time and depressed areas can develop, holding water, collecting runoff soils and creating problematic areas that need to be addressed. The integrated actions of the pest management and civil engineering can make a dramatic improvement, but they all rely on the observations and data sharing of the airfield management or flight safety teams.

Natural Resources is always a major component to a safe airfield environment. As we are all careful stewards of our airfield and surrounding environments, we all know the vital role that natural resources achieves in helping us maintain safety, while protecting and preserving the local resources and habitat. That is all well and good, but the mission of the base should be paramount, and a sensible balance needs to be maintained through shared interests and cooperation. Airfields are artificially maintained environments designed for the safe launch and recovery of aircraft, and wildlife conservation on an airfield has to be weighed against the mission necessity and flight safety assurance of the aircraft, pilots, and, lest we not forget, any potential ground victims, should a mishap involve urban or village housing areas. Natural Resources is on hand to evaluate the flora, fauna, and wildlife on the premises. What types of animals are in the immediate area, and the extended 10km radius around the airfield? How do these factors affect the flight safety of aviation operations? What are the preventative measures to ensure the deconfliction of aviation and bird/wildlife interactions? These are all pertinent questions that need to



Photo: Curlew by Keith Cowieson, Royal Air Force Ornithological Society. Reproduced by Kind permission

be addressed, and the known risk factors adequately mitigated. With this local knowledge base developed by natural resources, the necessary teams can go about addressing the issues.

Risk mitigation measures can be established based on the collected data from natural resources and combined with the daily observations of airfield management to enact protective measures. The airfield and aircraft movement areas need to be protected from wildlife. This can best be achieved by habitat management and safeguards such as an internal airfield fence, combined with a base perimeter fence. Off-base environments can be much more challenging to manage, but shared knowledge and friendly neighbours can go a long way to help prevent a BASH mishap. Get to know your neighbours, especially if they are farmers or maintain water features on their property. Forested lands can also present a challenge, as many times these lands are controlled and managed by other local or higher authority government agencies.

Habitat management can be as simple as maintaining a medium grass height on your airfield. The US Air Force maintains a standard of 20-40cms. Grass that is cut too short, or allowed to grow beyond this prescribed height, can present alternative problems depending on how high or low the turf has been cut. We all understand and appreciate the costs and labour necessary to maintain these grass standards, but a single mishap could potentially cover these on-going costs. Trees are also a dangerous feature to have on or around an airfield. They provide habitat for roosting, loafing and perching locations for hunting raptors. Any leaves or flowers can attract bugs and birds, and they just are not worth the risk of being on or near an airfield.

The same can be said of abandoned antennae and structures. With technology advancing from analogue to digital communications over the past few decades, many old communication towers, buildings, power generation facilities were merely abandoned in place on the airfield. If these



Photo: Old Airfield Buildings. Source: Wiki Commons, licensed under the Creative Commons Attribution-Share Alike 2.0 Generic license  
Photo by Des Blenkinsop

structures are not used, they should be removed. Think of and treat your airfield like a hospital surgical suite; you only want the vital and essential materials in there, as to reduce infection sources. The same mindset should be attributed to an airfield, you do not want any sources of aviation “contamination” that could create a BASH mishap. Thus, create an airfield that is meticulously managed and free of potential BASH contaminants.

Lastly, there are the neighbours, and they are just as important as the teams on base. Who are the people surrounding your airfield. Consideration should be given to the houses, farms and establishments in a 10km ring from the centre of your airfield. What does that look like: crop farming, livestock, forests, water features, shopping areas and parking lots, housing, largely rural or urban settings? These are all factors that will determine and dictate your BASH risks and actions. Your neighbours can help you in reducing the risk with simple outreach and understanding. Many times, a cordial visit, or a shared community invitation to come on base, can work wonders, and eliminate misconceptions and help illustrate the potential BASH risks. Participation in community events off base and information exchanges at these events can go a long way to provide an understanding of BASH, and how total teams integration is the best approach. Public education and active involvement is one of the best ways to win support of your programme and gain appreciation for the overall mission success from the community stand point.

Now that you’ve created this integrated teams solution on your base, be sure to check on your off-site and auxiliary airfields and training areas. It is just as important to manage these areas, as it is your home field. The “away” fields should be maintained to the same safety levels as the home field. Using the same management, coordination and data sharing, the integrated approach will work, but you may have to involve more teams and more players, especially if you are conducting flight operations at shared or civilian airfields. Education and awareness are your best bet, as many people tend to normalize the BASH risks. It takes practical effort and resources to create a safe flying environment, and unfortunately, sometimes these limitations force management teams to cut corners and accept avoidable risks. Many times, people and management teams become lackadaisical or grow weary of trying to continually harass birds and manage habitat. When this happens, those negative efforts garner a normalization of risk, where the local people simply become numb to an ever-present and sometimes increasing threat posed by wildlife. The attitude of “birds and animals are always here, just a part of daily life, what are you going to do?” can become a rudimentary belief until tragedy commands our attention, and by then it is too late. Proactive safety takes time, money, and active personnel, and without those factors in place, complacency becomes the norm until reactive safety investigations are necessary. As we have been repeated told, “an ounce of prevention is worth a pound of cure.” The same holds true in safety world, especially when minimizing and managing BASH risks.

## The Kind Of Damage That Can Be Done By Birds



### Spry's Comments:

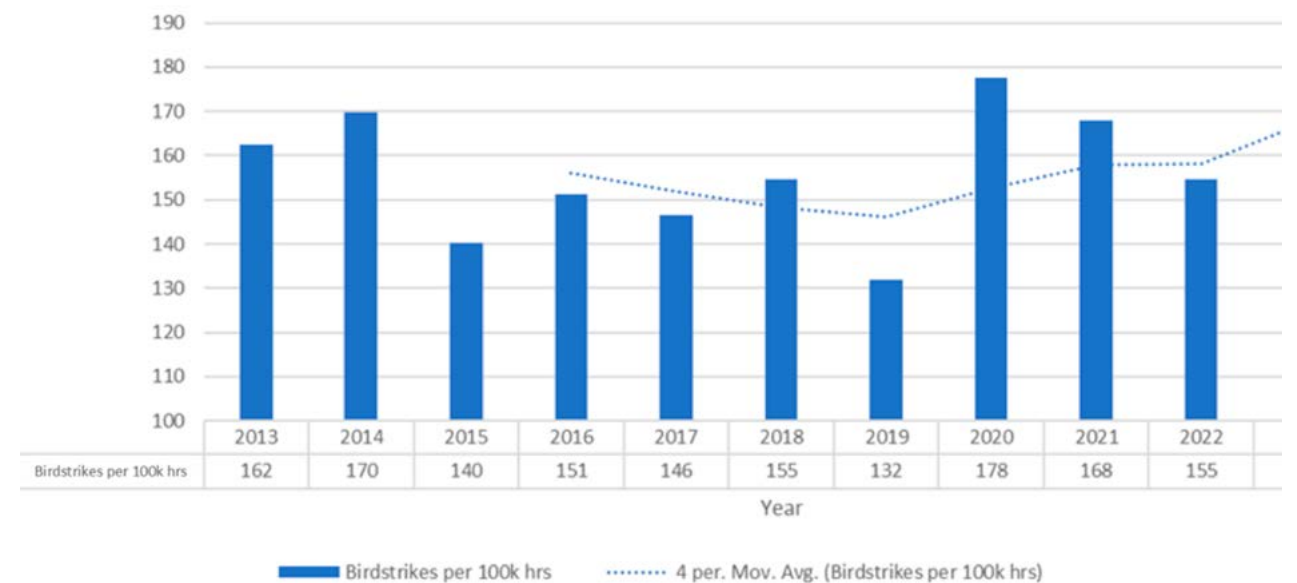


A great article from our USAF Safety Centre counterparts highlighting the importance of collaboration, communication, and threat management. Airfield/ Aerodrome management of wildlife is a critical part of reducing the likelihood of aircraft being damaged which results in a reduction of military capability. A few points to note:

- The term ‘Home and Away’ (no, not the Aussie Soap) ensures that we also consider training airfields and training areas as part of our safety management processes.
- Building relationships with local landowners and councils is crucial. Even something as simple as an invite to the airfield may help improve those relationships.
- A reminder that airfields are ‘artificially maintained environments’. The purpose is to ensure the safe and effective support to military flying operations. However, the airfield management team must also help protect the local environment as much as reasonably practicable.

Finally, a graph to show birdstrikes against RAF aircraft in the last 10 years normalised per 100,000 Flying Hours. This proves that birdstrike remains an issue which hasn’t gone away and needs constant attention and management. ■

### Birdstrikes per 100,000 Flying hrs since 2013



# I Learned About Flying From That

By Nigel Williams, Lextel Aviation



PA-23 Piper Aztec. Wiki Commons License: GNU Free Documentation License, Version 1.2. Photo by Ted Quackenbush

This is a true story. It could easily be filed under a multitude of titles, for example..

## CRM - CFIT - Pilot Error - Basic aerodynamics - Situational Awareness - Communication

### Setting the scene

A misty and murky summer morning in 1973. Low stratus covered the North West and Midlands with associated poor visibility, but which were forecast to break up to give almost CAVOK conditions over the whole of the UK by mid to late morning.

### It was the day of the British Grand Prix at Silverstone.

Silverstone airfield was a wartime bomber command OTU. It had an active service life of about 5 years, shutting down in 1946. In 1973 two of the three wartime runways still survived

– 06/24 (1280m) and 02/20 which was used for parking. The runway markings had all but disappeared and there was no airfield lighting of any sort. Neither were there any ATC services - just 'a bloke with a handheld radio who can give you the QNH/QFE and an estimation of the surface wind'.

My Commercial Pilot's Licence and IR were all of 3 years old and my log book had a majestic 500 hours total time, of which some 200 was basic training on light single and twin engine aircraft – Chipmunk, Cessna, Auster and Piper. The Air Taxi



RAF Silverstone 1945 – National Collection of Aerial Photography

company for whom I was working had entrusted me with one of their twin engine Piper PA23 Aztec aircraft. A real workhorse in its' day – 5 passengers, one of whom sat next to the pilot plus pleasant and vice-free handling with good unprepared runway and STOL capabilities.

In those days there were no Autopilots or RNAV, DME and transponders being for the deep pocketed airliners. The standard fit for the air taxi / light twin aircraft was 2 VHF Comm + 2 VHF Nav + 1 ADF with crank tuning. Co-pilots were not used unless specifically requested by the Customer! My task that day was to position empty from our base at Manchester down to Cranfield where I was to pick up 4 customers who were senior track marshals at the British Grand Prix. Their presence at the race was, apparently, absolutely vital. These four took the seats in the little rear cabin, which left the one other passenger seat next to the pilot. This seat was already occupied by a 'new' pilot who had just joined the company after some 12 years in the RAF. His last flying post had been as a senior flying Instructor. He had survived more than 2000 hours instructing in the venerable EE Canberra alone.

I'm going to call him 'Dave'. The previous afternoon Dave had asked me if he could accompany me down to Cranfield and

Silverstone to get some idea of how the world of the humble air taxi pilot compared to the very different world of service flying. Suddenly I was no longer the junior pilot! Hmm, we shall see.

There was a great deal of fixed wing general aviation traffic expected each with their own plan on how to find Silverstone and most of whom were aware that everybody would be trying to conduct their own ATC in possibly marginal weather conditions. But this is what we did for a living.

### My pre-departure flight plan

The short hop from Cranfield to Silverstone was about 20nm and my plan was to route to the Daventry VOR (DTY) and then follow the 138° radial off DTY until I obtained a 280° cross-cut radial from the Cranfield VOR (CFD – but which been an 'on test' private facility coding TST for some years! It had the label not to be used for navigation).

Weather briefing was obtained from a Met Office briefer over the phone who was confident that by the time we got to Cranfield the low stratus would be 'clearing nicely' and from then on the weather would only get better.

I would hopefully maintain VFR and initially fly at the local grid MSA of 1300ft plus our company minimum additive of 1000ft until overhead the field, and then let down visually into dead side join for a left hand circuit to the south westerly runway at Silverstone.

I had no clear plan as to what to do if VFR conditions did not exist.

I didn't pass any of this plan to Dave who would be in the right seat, not that that was intentional. It just didn't occur to me that another set of (very experienced) eyes could be very useful. There were no airfield plates or diagrams available we just assumed that our operations guys had checked that all would be well.

### The Flight

I should have paid more attention to the low, wispy strands of stratus on the approach to runway 22 at Cranfield during the ½ mile SRA procedure (there was no ILS there in 1973). The approach lights only really came into view when about a mile or so out and at an altitude of approximately 700ft QNH / 350ft QFE. Dave remarked that the weather seemed to be taking a while to improve here at Cranfield and whether going 20 miles west would make any difference. I figured that we had 'loads' of fuel (about 3 hours' worth) and that if we didn't like it then we could come back to Cranfield or divert to Birmingham or East Midlands, both of which had ILS approaches.

By this time the 4 passengers had arrived and were already piling the pressure on by reminding me how vital their

presence was at the pre-race briefing and at the race itself, and that if they weren't there then it would be quite possible that the whole days' proceedings would be cancelled. No pressure there, then! I decided we would go and have a look but would divert without any arguments if the weather remained 'clamped'. Much slapping on the back then ensued. We started up, got airborne, and took off heading directly towards the DTY VOR and climbed to 2300ft and remained on the Cranfield QNH as that would probably be more appropriate than the Regional QNH.

The radio was very busy with people heading towards the DTY, all with the similar idea of letting down on the DTY radial to Silverstone, and of course, all flying at similar altitudes! I didn't like the idea of messing with numerous other 'race-goers' especially as the weather showed no sign of improving. And then, suddenly, a gap appeared in the stratus to reveal the MI at Junction 15A where there was a slip road leading to the A43 to Towcester and Brackley with the race course about half way between the two.

The passengers were absolutely delighted. Dave, however, remained strangely quiet.

I decided to grasp the chance offered by this gap and descended to stay visual with the road. I now became totally fixated with keeping this feature in sight which became more difficult as the terrain started rising to meet the cloud base. We skirted just to the south Towcester and rejoined the A413.

With the road still in sight, and Silverstone a mere 3 nm from Towcester I selected ¼ flap and the gear down in readiness for spotting the airfield at the last minute. I descended to about 500ft above ground willing the visibility to improve or at least hold just enough to be able to spot the airfield and position onto a downwind leg. I was losing hope when all of a sudden the airfield appeared out of the gloom and so I turned left on to a short cross wind leg followed by a further turn on to down- wind. I was only just able to see the runway through the murk and was in danger of losing visual reference. The runway threshold briefly came into sight and so I selected land flap and tipped into a descending turn but the runway was again rapidly disappearing so the natural instinct was to tighten the turn and add some left rudder.

Suddenly Dave spoke, or should I say shouted, "SPEED - SPEED". For the first time I looked at the ASI which was reading about 90 kts and decreasing steadily. I also had about 60° of bank applied. At the same time I felt a slight aerodynamic buffeting. Out of sheer confusion rather than any good airmanship I started to level the wings and keep the descent towards the runway going. By now we were just on the centreline and passing about 300ft agl I levelled the wings and made a passable landing.

The passengers were over the moon and I was their hero of the day. Race tickets and paddock passes were handed out and we all agreed to meet back at the aeroplane later in the afternoon. They then rushed off in special course cars whilst I was left with a very quiet and thoughtful Dave.

#### The De-Brief

In silence we poured ourselves mugs of tea from a thermos. I was, some would say for the first time, lost for words. I didn't know where to start.

Dave put me at my ease and said "You know Nige you should have learned a valuable lesson today. Would you like me to give you a de-brief as I see it?" I immediately agreed. These were all the points he brought up.

- The planning stage back at Manchester seemed to be lacking in any real depth, notwithstanding the lack of information supplied by the company operations manuals etc. The best description was 'gash'!
- Why didn't I include him in the pre-flight planning?
- Why was there no formal briefing to discuss and agree fuel, weather, emergencies and a formal diversion plan?
- Why didn't I pay more attention to the weather on the approach into Cranfield? Shouldn't you have realised someone was trying to tell you something?
- Why did I allow the passengers to pressure me into departing to Silverstone without any real idea what the weather was like there. Had I heard of the term 'Press-on-itis'.
- Did I have any idea how many accidents there were every year to pilots' scud running?
- Didn't you consider including me in what little decision - making you made? A problem shared is a problem halved.

Dave reminded me that he had years of low flying in the Canberra at 300 kts and 250ft. and if he had encountered such bad weather, it would have been an immediate climb to MSA and a shout for help.

But the truly scary moment was that turn onto finals! Had you forgotten all about what happens when the bank angle/G-load is increased? We checked in the Flight Manual and found that the straight ahead non turning stall in the Aztec at our estimated weight, with Land Flap and the Landing Gear extended, was about 60kts. That base turn I made at 60° bank would have increased the stall speed to approximately 85kts. I had brought us within 5 kts of stalling the aircraft at about 400ft agl. The chances of survival for anyone on board would have been, at best, negligible. Dave had undoubtedly saved our lives – sounds dramatic, but true.

## Remember this simple but oh so important graph?

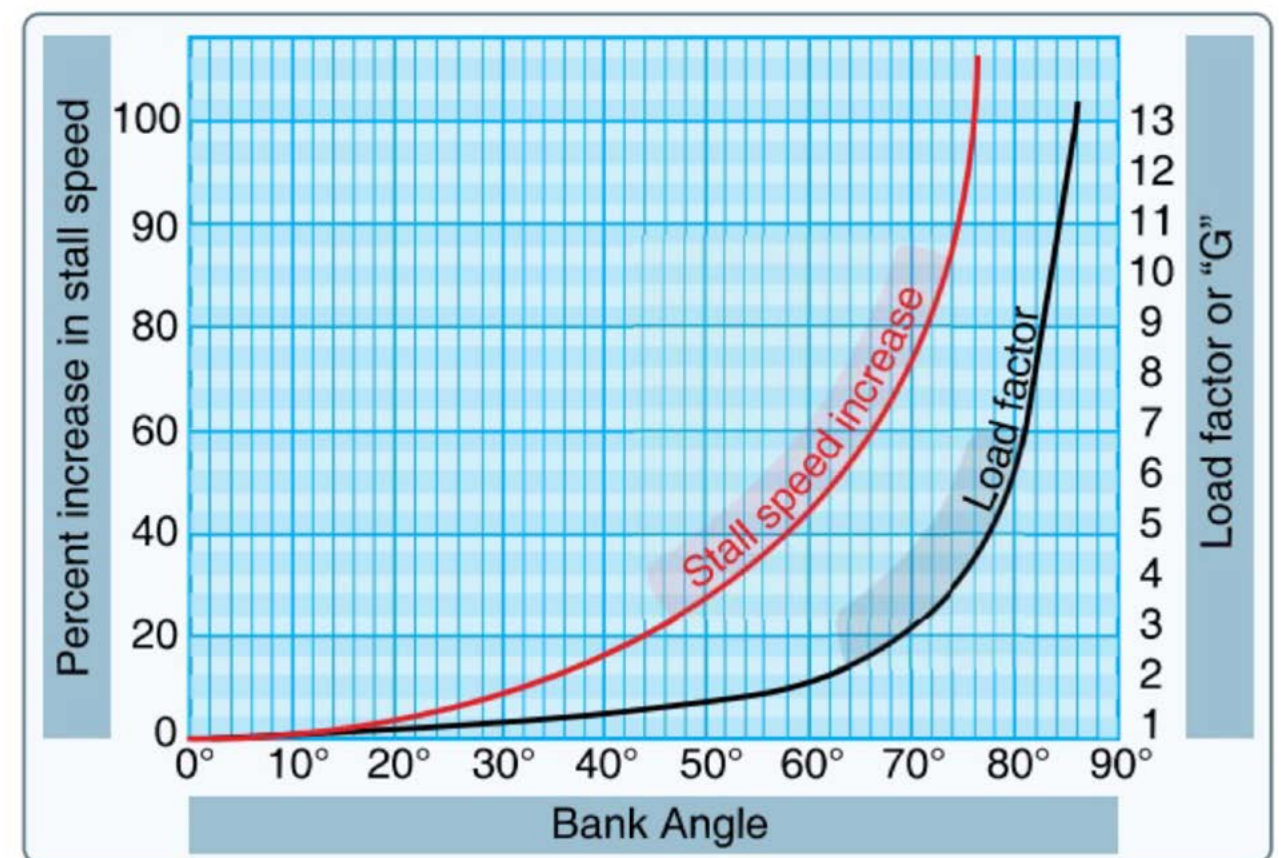


Image Source: Pilot's Handbook of Aeronautical Knowledge, FAA-H-8083-25C; [www.faa.gov.uk](http://www.faa.gov.uk)

#### What did I learn from this?

55 years later I have now retired with about 10,000 hours spent flying all over the world in a variety of aircraft, big and small, military and civilian. Nimrods, Gulfstream, Falcons, BAE 146, single engine Austers, I won't bore you with more!

I learned that in aviation you never stop learning. If you think you know everything, believe me you don't! CRM did not exist in those days. When I first encountered it, I was a dinosaur. We didn't need it and we thought we got on fine without it. But since reading the safety and accident reports I have become a serious fan. It can help – it does help. It's all about communication and using all the resources that might be available. Ask questions, share information,

don't assume that a junior co-pilot doesn't know the answer – he may be a bit of an 'ace' on the subject under discussion! Encouraging a free flow of ideas will earn respect - but be ready to the make that final decision.

Know your aeroplane and how to operate it. Learn the good things and the things that could just ruin your day. I hope you agree that my actions (or lack of) would easily have lined up all but one – the final one - of the holes in the Swiss cheese. It's not too dramatic to say that Dave saved 6 lives that day.

(He didn't take to Air Taxi work and only stayed a short time)

# 'A Pocketful of Skittles'— A Winter's Tale of Near-Miss Fatigue

By TSgt Robert T. Summerville, USAF



Image supplied by Langley AFB, USAF. Reproduced by kind permission

When I was a Senior Airman, I was stationed in Great Britain, where I was a KC-135 aircraft hydraulics specialist. I loved what I did, and I enjoyed the Airmen with whom I worked. Yes, there were many days that were harder than others, just like any job. We worked 12- to 14-hour shifts, including many weekends.

One Friday morning, as I ended my mid-shift at around 0800 after a long week on the line, my Flight Chief said I needed to go home, get a few hours of rest, and report back to work in 8 hours with my go-bag. I was told to pack light, but to be prepared for cold weather. I quickly went home, packed, and tried to get some shuteye.

When I arrived at work, ready to go, I was teamed up with a Staff Sergeant. Neither of us knew what we would be tasked to do. We soon got word that we were heading to Germany, to fix a KC-135 that belonged to a stateside squadron. I was pumped! I loved the challenge of fixing our own aircraft but fixing someone else's – thrilling!

I checked the weather forecast for our soon-to-be adventure. It showed very cold temperatures— around five degrees.

There was a snowstorm approaching, and it was projected to hit shortly after we landed. When I mentioned it to my fellow maintainer, he said "Great" in a monotone voice that let me know he was not as enthused as I was.

The task was to replace the left anti-skid valve, which was leaking hydraulic fluid profusely. The anti-skid valve is like a car's anti-lock braking system. It prevents the wheels from locking up when the brakes are applied. In warmer climates, a KC-135 can land without the anti-skid activated; however, in this case, the aircraft was flying home to Delaware, where conditions would not permit landing without it.

The clock was ticking when we arrived in Germany. For missions of this type, maintainers are authorised 16-hours of work for the first day, and 12-hours every day after, until the mission is completed. We had about 12-hours remaining once we arrived on location. The Flight Commander met with us for a brief rundown of the issue. His last words changed everything: He said there were fallen Airmen onboard, and they needed to be transported home to their families. Immediately, my co-worker and I were overcome with both emotion and

determination. We looked at each other without saying a word, knowing the importance of what we had to do.

The weather was already cold, but about one hour into the job, the snow and wind really started to pick up. The wind chill went into the negatives. We proceeded to keep our heads down and stay the course. We were so focused on the task that we lost track of time. At one point I looked at my watch, and saw we were close to our 16-hour mark. We hadn't stopped for breaks, water, or food, and all I had to eat were the Skittles in my pocket.

The SSgt said we needed to start cleaning up to end our shift. I convinced him to keep working, since we were close to finishing the job. He reluctantly agreed. We grabbed some water, and I reached my frozen fingers into my pocket for more Skittles, hoping the sugar would help me fight the fatigue. "We must continue for these Airmen and their families," I said to myself.

Finally, we finished all operational checks, cleaned up the area, and reported to the Flight Commander that the aircraft was greened up and ready to fly. We ended our shift after 23 hours. This was, by far, the hardest mission I ever had done. Between the cold, the sideways-blowing snow, and the long hours, we were exhausted.

We then had to rent a car and drive to our hotel. I offered to drive, because the SSgt was experiencing worse effects of fatigue than I was. Still, he brushed it off and said: "I'm fine." We both felt a bit leery about driving after what we had been through, but we decided to go ahead.

We finally got our rental, mapped out our rather short 10-minute drive, and proceeded to our hotel. Neither of us spoke. We didn't even want the noise of the radio – just solitude. All I could think about was how warm and cozy the bed that awaited me would be. About four minutes into the drive, I noticed I was dosing off as my stomach growled. Then I remembered I had a few Skittles left in my pocket.

While digging for the remaining Skittles, I looked over at my co-worker, and saw that he was asleep at the wheel. I panicked



Image: Wiki Commons: GNU Free Documentation License, PiccoloNamek

and yelled his name. He awoke with a start as we headed into oncoming traffic. He yanked the wheel to get back on course, avoiding a head-on collision with a semi-truck. He overcorrected, and we crossed over our lane and slid into a snowy embankment off the road. After stopping, we looked at each other, as our hearts practically beat out of our chests. We were fine, with no injuries, but were ashamed for not acting to prevent the accident.

There were many risks associated with this story, and every one of them should have been mitigated and/or halted. We took the risks because we believed the mission required it. It was an amazing feeling when we saw the aircraft launch and head home; however, we eventually would have fixed the jet, even if it had taken another day. We could have died in the car accident. We could have been sent home in the same fashion as the fallen Airmen aboard the KC-135.

We should never create unnecessary risks by pushing the boundaries of a mission. We must assess the risks we take every day, and hold the line, not crossing any safety thresholds that are in place. We must hold each other accountable, no matter the rank, and thereby ensure we all go home to our loved ones the only way we should go – with pride.

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## Spry's Comments:

TSgt Summerville implies the responsibility is all his and his colleague's to have pre-empted this frightening near-miss. However, this story presents a cautionary tale for Supervisors and Line Managers too. And, it is not specific to US personnel. Getting the job done safely doesn't just apply to the workspace. If you have allowed fatigue to overtake you or your people such that it is dangerous to travel home, you must act – preferably in a pre-emptive way, but proactively too. Have you considered the fatigue outcome of the task you have set yourself or others? Are you monitoring the difficulty of the task as it progresses? How long is it taking? What are the environmental conditions experienced? Are your people being monitored for the uptake of breaks and hot rations? Have you got contingency on unit to provide adequate rest facilities to avoid forcing tired people to travel home, especially in dark wintery conditions? Would it be a case of pot-luck for a room to be available on base if needed? Are they even entitled to use on-base accommodation? Could you perhaps provide drivers to get them home safely and then collect them for the next shift? RTAs are one of the biggest causes of the RAF losing people. Are you executing your Duty of Care? Think it through. ■



# I Learned About Flying From That – Diversions

By Gp Capt Pete Warmerdam



I thought that I would rack the dark recesses of my brain and divulge a little incident that I had when flying in, you guessed it, a Wessex. I was Combat Ready, but I was still a little 'green' as I was still in my first year on the Squadron. For those that have captured my earlier exploits, you will know that the Wessex of 72 Squadron was based out in Northern Ireland supporting Op BANNER.

This was to be my first foray over as captain – you may recall what happened when I last ventured out as a co-pilot, but that is another story! Anyway, I was tasked to take an aircraft over to STANTA training area and support the next Battalion slated to go to NI under Exercise NITAT (Northern Ireland Training Advisory Team if memory serves...). The idea being to provide them a dedicated helicopter for a week to get used to tasking and deploying from the asset.

The deployment went without a hitch – refuelling at Shawbury, we landed at NITAT in the late afternoon. Given a room on the camp to sleep and plan, we soon joined up with the infantry planners and worked out the battle rhythm for each day. It was very much a crawl, walk, run for the unit, so



we started with some ground briefs and built up to carrying them short distances, so that they could get used to having a helicopter 'on tap'. They needed to get familiar with timings that it would take for them to request the asset and then get to the HLS and many other things besides. By the end of the



Image: copyright © IWM MH 30555, <https://www.iwm.org.uk/collections/item/object/205189650>

week, they were working seamlessly, and we were conducting dynamic Eagle Vehicle Check-Points and supporting multiple units on the ground. All the kind of things that they would be expected to need in NI.

It had been a very successful week all round. We had achieved some great flying practice and the troops were, to my mind, well up to speed on tasking and using a helicopter effectively. It was time to get back to NI. We could manage

the trip with a refuel stop at Shawbury, then bounce across the Irish Sea to Aldergrove. This would take most of the day, so we planned the evening before and were going to get airborne early morning the next day to make it to Shawbury by lunchtime. Just one small snag – fog. STANTA had had amazing weather all week, yet the following morning's forecast indicated that the local area would be fogged out. However, the rest of the country along our route was forecast to be absolutely cloudless and fogless. Not a problem, we thought. IF take off, get VMC on top of the thin fog layer and then route medium level to Shawbury for a VMC let down.

The following morning, we could see that the local area was completely fogged out as predicted. We checked the met and the fog extended about half way across the country along our route. I cannot remember the exact diversion criteria that were in force at the time, but whatever it was, we could meet this. Likewise, with Shawbury and the surrounding airfields were 'Blue' and forecast to remain that way all day – winner! We were happy to launch.

It was my first real IF take off in anger and so I was a little apprehensive. However, the training kicked in and, whilst it was probably not the tidiest, it was safe, and we emerged into bright sunlight at about 500ft agl. Climbing up to a couple of thousand feet, we settled into navigating our way to Shawbury. We contacted the Lower Airspace Radar Service, which was quite extensive back then, and we



Image: [www.geograph.org.uk/photo/1075402](http://www.geograph.org.uk/photo/1075402); © Copyright Andrew Smith, Attribution-ShareAlike 2.0 Generic (CC BY-SA 2.0)

got them to radar vector us. What? I hear you say – Radar Vectoring? Why did you just not use the radio aids nav kit? Well my friends, the simple fact is that the Wessex did not have any. What's more it had very limited range and we were armed with a General Purpose Machine Gun (GPMG) – more of that later...

All was going well – or so we thought, when Cottesmore Radar (yes, I know it does not exist anymore and probably has not for decades) piped up on the RT with something to the tune of, *“Wessex confirm your destination is Shawbury?”* To which I replied, *“Yes and if they wouldn't mind accepting us for a PAR, then I can get some IF stats in (always thinking!)”*. However, the reply which came back caused one of those moments where time seems to stand still, and you wish that you had taken up a different career. *“Wessex, the west coast of the UK has just gone 'Red' in fog, Shawbury cannot accept you, please state your intentions...”* That was a little bit of a problem. As the forecast had been 'gin clear' all day, we only had VFR fuel and, if Shawbury could not accept us, we needed somewhere else to land, and soon. Oh, and we had the GPMG...

We were still over the now extensive fog bank and it was abundantly clear that the mid country 'suckers half-country gap' that I was relying on was well and truly closed. I could not see the ground anywhere, only an extensive blanket of fog stretching in every direction to the far horizon and clearly, if the RT was to be believed, well beyond that too! Less a comforting blanket, more a white morgue sheet.

One thing that I was always taught by the more experienced crews was that things are never quite as bad as they first seem. You just need to take a deep breath and think through the problem. Well we had some fuel, probably enough to get us around 60 miles, but no means of safely letting ourselves down through the fog except a PAR or, as a very last resort, GPS. I asked Cottesmore if there were any airfields within 60 miles of us that were better than red and preferably military. Their quick answer was, *“No.”* Short, but not very sweet. Well at least that made it simple. We just had to stick with our Shawbury plan, declare an emergency and fly the PAR with the GPS as back up to do the last 'little bit' over a runway. I must say here that due to the Wessex's superbly poor lift performance, fuel was always a luxury. As we operated in some of the worst weather in the UK, with no Nav Aids, we regularly practiced an emergency GPS let-down procedure. So, we informed Cottesmore that, despite Shawbury stating that they could not take us, we were coming in regardless for a PAR. Cottesmore kindly handed us over to Shawbury radar; their welcome was not quite what I had expected...

*“Wessex, this is Shawbury Radar, we are at capacity recovering our own aircraft and simply cannot accept you.”* This was a bit of a blow, but I had that 'declare the emergency ace' up my sleeve, *“Pan Pan Pan Wessex declaring a fuel emergency requesting radar vectoring for the PAR.”* This was not untrue; the

Wessex always had a fuel emergency. However, once again, the normal course of events when a Pan is declared, and everyone responds to your every whim was thwarted. *“Wessex your Pan is acknowledged. However, we have 5 x State 2 aircraft and therefore cannot recover you. We suggest you try elsewhere.”* I think I mentally questioned the parenthood of that air trafficker, but it was clearly not their fault; they were in the same jam I was – well nearly, they were not stuck above the cloud tapping the fuel gauge hoping it was misreading.

Clearly the rest of the crew had not been idle. The co-pilot has been diligently planning the IF GPS let down into Shawbury and the crewman was busy looking at the map for alternatives. It was the crewman who stated that we should try Liverpool International. The thoughts of, 'I have no civvies and we are armed with a GPMG' were trumped by near certain death if we ran out of fuel up here. We had just enough fuel so we put the call in to them to state we were coming in. I must say they were a little surprised. They stated that they were Red and that their weather was so bad that they had ceased all operations. Although he stated that if we wanted to give it a go, he was game (or words to that effect) – good man! The only challenge was that he did not have a precision approach that we could use, and we did not have the fuel to commit to some convoluted SRA – GPS it was!

Just about then, my guardian angel appeared. Miracle of miracles, I could see a very small hole in the fog; the only one I had seen all day. I am not sure what you would call the manoeuvre, but 'twirling banshee' probably best describes it best. We declared that we would join VFR after all – what Liverpool Radar thought I don't know. We ended up in a 20ft hover in sight of the ground (just) and then 'garden hopped' through suburbia for about 1 mile all the way to Liverpool Airport, whereby I casually asked Tower clearance to land. He was most surprised (and a bit relieved) to hear from us and stated that we could land anywhere we wanted.

We hopped over the fence and ground taxied a short way to the pan, shut down and then cancelled our Pan. We telephoned all the various agencies to make sure they know where we were and then pondered the machine gun issue...

The crewman came to the rescue again and stated that, in similar circumstances, he normally took the machine gun to the Police Armory. I was not sure whether he meant that he had often diverted into Liverpool to avoid nearly dying or something else, but I thought that it was a good plan. My 'brainwave' was to wrap the GPMG in a couple of bin bags and then carry it to the taxi and then onto the armoury so that it did not cause a panic in the Terminal. We were escorted by the handling agent through a sea of very cheesed off holiday makers; however, to my surprise, when we got to the exit, the security guard stated that he wanted to X-Ray our bags...



Image: Liverpool John Lennon Airport; Photog Richard Hoare: Creative Commons Attribution-Share Alike 2.0 Generic license

I questioned the sanity of this, noting that we had our knives and the mini flares, but he was adamant. The 'gun-in-a-bag' went last, and I informed him that it was a machine gun. He just nonchalantly stated, *“Yes that's fine, just stick it through the machine* (in a very deep Liverpoolian accent).” Phew I thought. That thought, however, was not to last...

*“[Deep expletive], that's a machine gun! You can't take that downtown Liverpool, there will be [expletive] World War [expletive] Three!”* It seemed like a very short time later that the 'on station' armed response unit arrived tooled up and ready to shoot whichever manic was running rampage through Liverpool Airport (thank God this did not occur more recently). As they kicked their way through the door with sirens blazing shouting, *“Where's the shooter?”*, I thought to myself I wish I was back above the fog...

#### So what had we learnt?

The met team are only providing a forecast, not fact. Does your plan have a 'what if' factor built into it? I still debate with myself whether there was anything I could reasonably have done differently here – I will leave that up to you...

If it can go wrong, it will. Always be prepared and have a contingency plan. The most simple transit can throw up the biggest surprises.

Practice your emergency and contingency procedures. Why not ask the sim instructor to throw something 'left of field' at you when you least expect it – can you deal with it? Rigorously debrief yourself and the crew to examine what you could do better.

When the 'poo hits the fan', don't panic. Think through the problem. What can you do and what is the best solution that the crew can deliver. However, if a better option emerges, be decisive and take it.

In poor weather, a training unit may not be the best diversion – they will undoubtedly have their own challenges.

Liverpool Airport has some great and very understanding police and the city is a great night out...

# Do you sit at a desk all day?

Does your 9 to 5 leave no time for structured exercise?

Staying healthy at work is easier than you might think. Try building the following desk – based exercises into your working day.

## Chest stretch



Working on a keyboard your chest muscles can become tight and the muscles between your shoulder blades might be underused. This stretch will help correct this muscle imbalance:

- Sit forward from the back of your chair
- With your thumbs pointing towards the ceiling, open your arms out to the side until you feel a stretch in the front of your chest. Ensure your shoulders are back and down
- Aim to switch on the muscles between your shoulder blades by gently drawing them together. You should not feel pain or tingling in your arms
- Hold the stretch for 20 seconds and repeat three times.

## Sit-stretch



Long periods of sitting with your knees and hips flexed can cause the muscles at the back of your legs (hamstrings) to shorten and become tight. Address this problem with the following stretch:

- Perch on the edge of your seat and stretch your right leg out in front of you
- Rest your heel on the floor with your foot pointing up
- Lean forward slightly from your hips and look straight ahead. You should feel a gentle stretch but no pain along the back of your right leg
- Hold the stretch for 20 seconds, repeat three times and then swap legs.

Moving more throughout the day can help keep your weight at a healthy level and limit your chances of developing a number of serious illnesses.

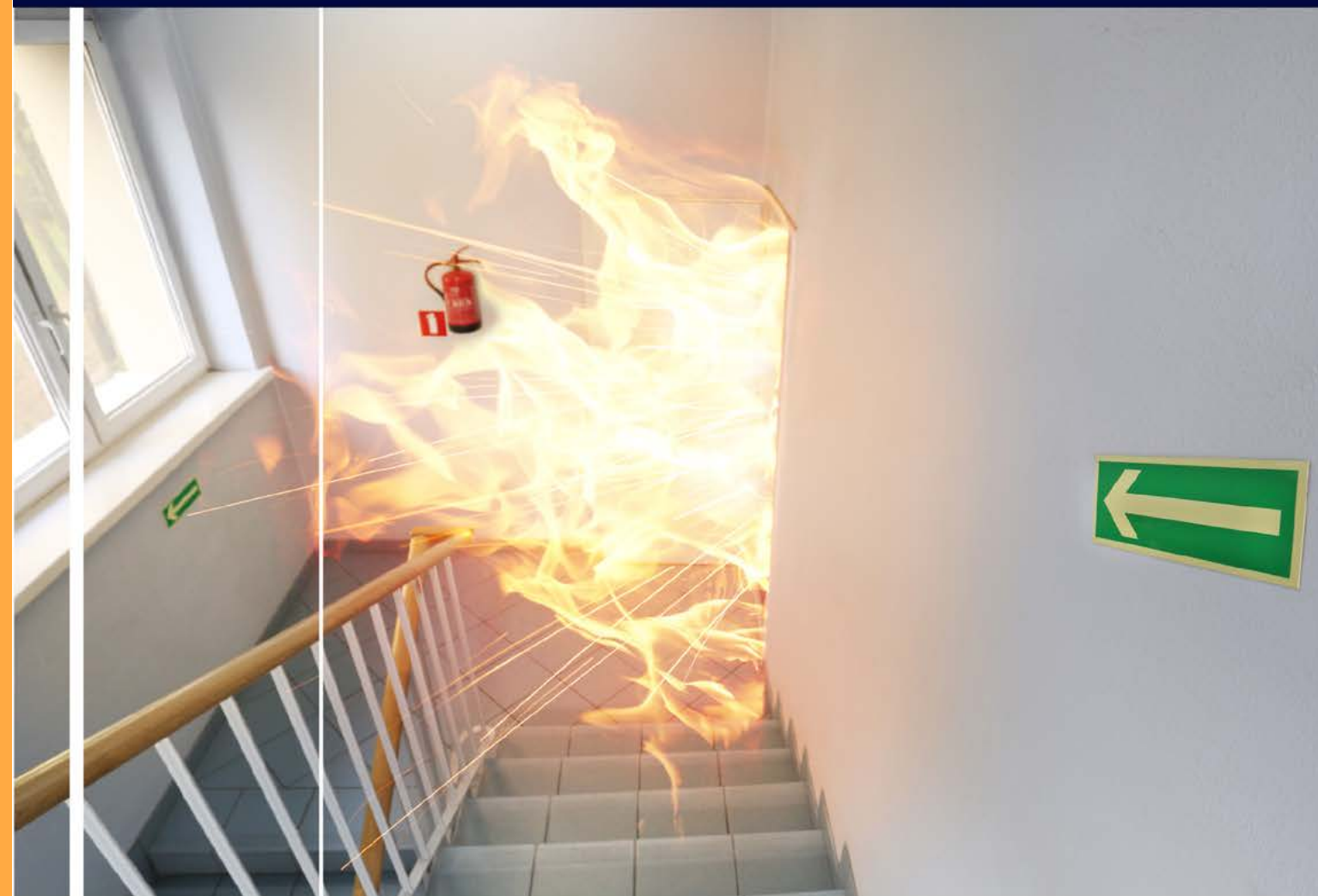
[www.csp.org.uk/publications/do-you-sit-desk-all-day](http://www.csp.org.uk/publications/do-you-sit-desk-all-day)

DISCLAIMER: The activities suggested here have been designed to cover a range of abilities and should not cause any harm. If you do experience any pain or discomfort, stop immediately and speak to a health professional such as a chartered physiotherapist or your GP. Employers should provide workstation assessments for staff. If you haven't had your workstation assessed, speak to your employer.

Capita Fire and Rescue

## Fire door safety campaign

# CLOSE THE DOOR ON THAT FIRE!



## An open or defective fire door cannot do its job.

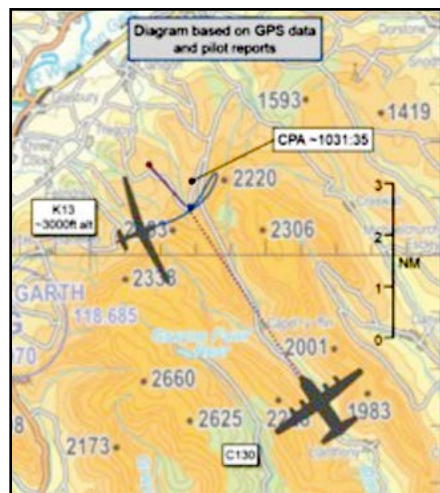
Capita



# Airprox Highlights



With Comments from Wg Cdr Spry



**K13 Glider vs C-130**  
10 Oct 22  
Airprox No. 2022239

**The K13 Glider Pilot** reported that they were flying along the ridge between the Black Mountains Gliding Club and Hay Bluff with a student at the controls. They were at height of between 1700ft and 2300ft QFE. When crossing the Gospel Pass from an east-to-west direction at just below 2000ft and around 50kts, they spotted a 4-engined military aircraft out to the right side. The aircraft had passed them before they had spotted it, so no avoiding action was taken. They contacted BMGC base by radio to identify the aircraft as they considered the risk of collision was high.

**The C130 Pilot** reported that whilst conducting low-flying to complete an Air Load Master (ALM) role check, the aircraft transited south to north in a valley in the Talgarth/Hay Bluff flow arrow en-route to its next simulated event.

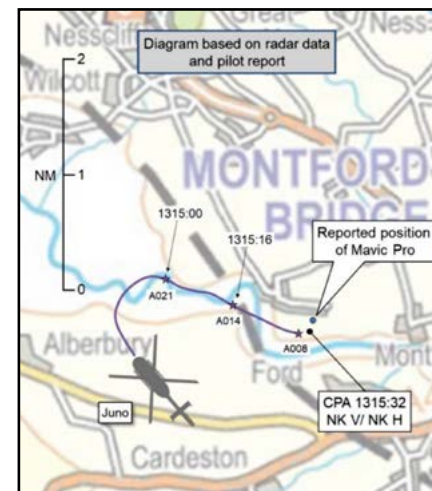
The routing choice was clear of the glider site, with potential for other traffic briefed during crew brief and at authorisation. The aircraft was climbed to exit the valley at its most northerly point with the intention to pass through an elevated saddle at the end of the valley. Conducting a slightly early climb to improve lookout, the aircraft had reached a height to comfortably generate 250ft MSD through the saddle when the

ALM under examination indicated a glider above and to the right of the aircraft. Although not sighted with the glider, the aircraft was immediately manoeuvred to the left and descended to 250ft MSD to avoid the indicated aircraft. Having manoeuvred the aircraft, the pilot became visual with a glider travelling in a westerly direction above their height. The glider passed above and to the right of their aircraft.

For the full report, see Airprox No. 2022239 on the Airprox Board Website.

## Spry's Comment:

There have been 3 Airprox in this location, 2 of them within a year (all different types) and that clearly makes this a site of particular interest. The Black Mountains Gliding Cub (BMGC) is predominantly a hill soaring gliding club, making the most of the ridges in its vicinity; which ridge face is utilised will depend on wind direction and conditions on the day. Gliders utilise an exemption to the Standardised European Rules of the Air that permits a hill-soaring glider to fly below 500ft AGL or closer than 150m (500ft) to any person, vessel, vehicle or structure (always provided that it does not recklessly endanger life or property of others). There are several soaring ridges in the vicinity that BMGC gliders can use; the SW-NE ridge in this Airprox is used in even light winds between northerly and westerly. There is also a south to north flow arrow marked on military charts (which is not shown in the diagram above, nor civilian charts) that runs between the BMGC and a British Hang gliding and Paragliding site that will bring a military aircraft straight out onto the middle of this ridge and into potential conflict with any soaring gliders. If you fly in this area, or similar set-ups around the country, consider contacting the glider club before flight or on their frequency once airborne. In this particular case, there are no obvious workable solutions and direct engagement and education for both sides remains the best way forward. Be cognisant of the day's wind conditions and likely area/ridge for gliding activity and, as tempting as this flow arrow may be, consider that an alternative route may be wise. With no interoperability between the Electronic Conspicuity equipment fitted to the K13 and C130, and neither in receipt of an ATS, See and Avoid was the only operating safety barrier in this incident. ■



**Mavic Pro Drone vs Juno**  
26 Jul 22  
Airprox No. 2022219

**The Mavic Pro Pilot** reported that they were conducting an automated 'zig-zag' flight in the open FIR. On the day in question, they emailed Shawbury Ops, as is requested by the RAF, to advise of their intention to conduct drone operations at the given location. The time of operation was given as between 1200 and 1700, and with the maximum height of 120m and 500m radius of the given map reference. No confirmation of receipt of information was provided. At approximately 1400 they became aware that a Eurocopter was approaching directly from the west. It was fast and at low-level. It appeared from their point of view that the Eurocopter could have been low enough to conflict with their UAS. As soon as they identified that a conflict might occur, they assumed manual control and descended to ground level and landed. They immediately checked planefinder.com, which was running on their tablet and showed ADS-B data. It identified the aircraft as a [Juno] and that their height was 675ft. The [Mavic Pro] had been flying at 400ft. They were surprised that the conflict had occurred as they had assumed that the pilots of all the aircraft in the LFZ would have had knowledge of their operation and would have kept a wider separation. They emailed Shawbury Ops again to confirm they had received their earlier

advice and to raise their concern about the proximity of the incident. [Shawbury Ops] confirmed that they did have the first email and said they would investigate and get back to them but so far they have heard nothing. The RAF ask drone pilots to notify them of operations in the LFZ, but this incident did not give them much confidence in this system.

**The Juno Pilot** reported that they were aware of the location of the notified drone flying and had ensured that they were above the maximum

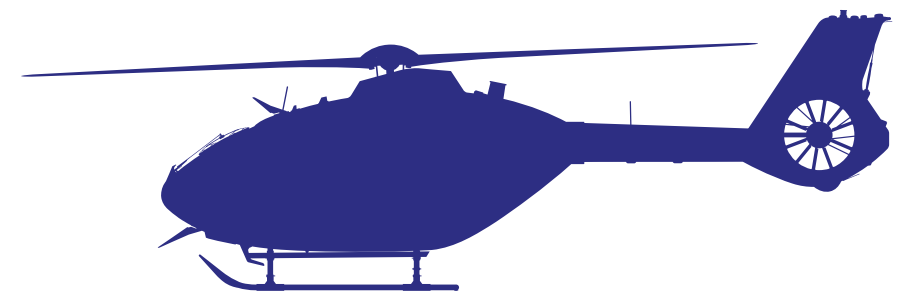
height of the planned drone flight of 120m. They did not visually acquire the drone but had been more than happy with their height to ensure deconfliction.

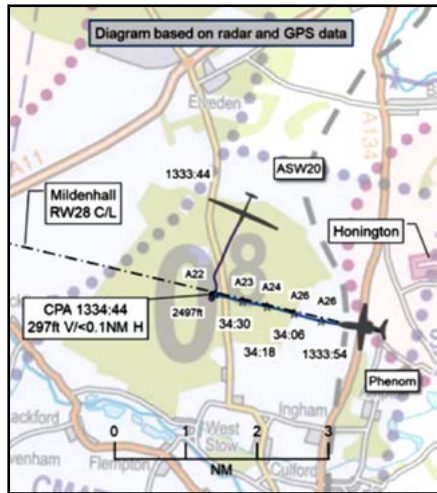
**The Shawbury Controller** reported that the Airprox wasn't reported on any ATC frequency and the ATC Supervisor at the time of the Airprox had no knowledge or awareness of an Airprox event. The video/audio data was unavailable as non-quarantined data is automatically deleted after 30 days.

For the full report, see Airprox No. 2022219 on the Airprox Board Website.

## Spry's Comment:

A good news story! This Airprox was assessed as an E (normal safety standards pertained) so you may be wondering why I have included it in this edition's Airprox Highlights... Well, there is good information to highlight and good practices to share from this example. According to the CAA CAP 722 Drone regulations, a VLOS (Visual Line of Sight) drone flight below 400ft AGL does not require a drone operator to notify anyone of their drone flight. But it is to our advantage, especially in a busy DUA (Dedicated User Area), to have prior awareness of any drone activity. Shawbury make it easy for drone operators to notify the station of their (sub-400ft) drone flight with lots of information on their internet page and they have also produced a handy tri-fold on operating a drone safely in LFA9. How easy is it for a drone operator to notify your station of their (legal) flight? Good relationships, engagement and education with local drone operators (local businesses, emergency services, industry) can be fostered through positive engagement; if you are at a station that hosts a RAUWG (Regional Airspace Users Working Group), invite these operators along. If you do not host a RAUWG, consider a Military Civil Air Safety Day (MCASD) or even a drone-specific awareness day, not just to educate our crews on drone operations but to educate drone operators on our operations, particularly low flying. It's also great to see drone operators reporting airprox; only through the complete picture of a crewed / uncrewed aviation airprox can we identify safety improvements. In 2022 there were 9 drone operator-reported airprox; in all cases the piloted aircraft never saw the drone and it was only in this Juno airprox that the pilot had prior awareness of the drone to be able to deconflict. See and avoid remains the primary barrier to drone MAC. ■





### LS3A vs A400M 23 Aug 22 Airprox No. 2022195

**The LS3A Pilot** reported that [they had been part of] a gaggle of gliders thermalling low-down during a competition out of Keevil. An A400M came past, [approaching from south] at approximately the same height and forced avoiding action. The LS3A pilot reports that they turned out of an established thermal to avoid collision. (The pilot of the LS3A confirmed that

their PowerFLARM installation did not have an ADS-B capability).

**The A400M Pilot** reported that they had planned a low-level flight for the morning of 23rd August. A NOTAM warning over Keevil Airfield (of radius 5NM) described a glider competition within its confines. The route to and from [their tasking] that day required passing close to that event. Due to the extremely congested nature of the low flying system in that area, it left few options but to circumnavigate the NOTAM. The route was plotted outside the NOTAM area even though it was a warning, not an avoid, in order to mitigate against coming into proximity with the gliders partaking in that competition. The last NOTAM check was made and recorded on the authorisation sheet at 1000 prior to commencing the out-brief, authorisation process and walking to the aircraft. The NOTAM had not changed at the 1000 check. The crew flew their planned route past the NOTAM area at Keevil. No gliders were

observed. Having completed the [task] the crew flew diligently back along their prescribed routing north-bound, cognisant of the potential for gliders in the area. As such, the crew members were paying extra attention to the area of the NOTAM. The aircraft was about 300ft AGL, north-bound, as it passed east abeam Frome by approximately 2NM. The pilots in the [front-left and front-right seats] reported seeing gliders but were happy there was no conflict. The instructor (in the front-centre seat) was unable to observe the gliders. No TCAS returns were observed in the vicinity so the only situational awareness they had on them was from visual acquisition. On returning to [departure airfield], the ATC supervisor asked if they would call the organiser of the gliding event which they duly did. The event organiser explained that one of the glider pilots had raised concerns about the proximity of the aircraft to each other. [The A400M pilot] reported that they had not observed any gliders close to them and that they had meticulously followed their

planned route outside the NOTAM glider competition area. If, therefore, they had encroached on competition aircraft then they were operating outside the area defined by the NOTAM. However, regardless of whether they had been outside the NOTAM area, they were operating in Class G airspace and as such it is see-and-avoid. They are continuously looking-out for gliders, microlights, paragliders and GAT that are not equipped with transponders

or TCAS as well as all the other users of Class G airspace. If they had seen any aircraft that they thought had got close to they would have taken immediate positive action to maintain separation. The event organiser responded by sharing an image of a NOTAM on their [EC device] screen (which [is a system that the A400M pilot] does not use for NOTAM research) showing a glider cross-country route extending well beyond the original NOTAM area and through

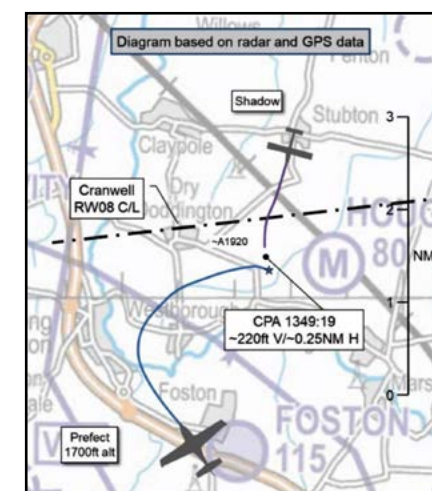
which the [A400M] flightpath had taken them. They went on to say that "...we also NOTAM the route but publishing time depends on workload at CAA AR Ops in the morning...". It would appear that at the last NOTAM check made at 1000 the glider cross-country route had not been published on the [mission planning system]. Regardless, they had not seen any aircraft close to them at any stage of their flight and therefore had not raised a DASOR.

For the full report, see Airprox No. 2022195 on the Airprox Board Website.

### Spry's Comments:

This incident highlights a potential misunderstanding and ambiguity in the detail of a NOTAM. The 'original' NOTAM detailed intense gliding competition activity within a 5nm radius of Keevil and the crew, although not obliged, had made a sound decision in avoiding it. This NOTAM, however, did not paint the full picture and a second NOTAM was released on the morning with that day's competition route. The 'original' NOTAM did, however, publish details of where that information would be promulgated, albeit it was not explicitly clear the routing would be beyond the original confines detailed.

When you see a NOTAM for a gliding competition, be cognisant that it may be a generic warning and will probably not show each competition day's specific routing. This information will be available via telephone, online or by requesting the details whilst airborne on the frequency published. It may be another job to add to the list of things to do pre-sortie, but having the best awareness as possible of areas of intense glider activity will heighten your lookout and may influence your route selection. It is also wise to request a Traffic Service where possible however, beware of the limitations of radar performance against gliders. Where a TS is not possible, a quick call on the gliding frequency published may be enough to give the participating glider pilots awareness of your presence. Transponders are not mandated for gliders so TAS or TCAS will not be useful here unless your platform has access to data from FLARM. ■



### Prefect vs Shadow 18 Oct 22 Airprox No. 2022250

**The Prefect Instructor** reported conducting Staff Continuation Training (SCT) with a pilot student acting as IF

safety pilot. They had briefed the student during the sortie brief and outbrief about the importance of their lookout, and specifically their responsibility to take control if necessary to avoid a collision. During the instrument feed-in for a PAR at Cranwell, they were positioned at 1500ft on the extended centreline for RW08, being marshalled by the Cranwell Approach controller. They were concentrating on instrument scan and the student was conducting a sound lookout. Immediately upon being handed over to Talkdown, and before they could change the frequency, the student declared "I have control" and began a shallow descent. They didn't recall the student describing the threat aircraft position but, upon looking up, they saw a single-engine high-wing light-aircraft [on the left] which had been co-altitude and travelling at a

speed which they estimated was less than 80kt. They took control back from the student and manoeuvred the aircraft to increase lateral separation. They estimated the nearest point of approach was less than 200m and 100ft. It was difficult to judge the actual collision risk because of the low speed of the threat aircraft, but had the student not taken control they would have been at the same altitude and within that distance. They reported an Airprox to ATC and established a safe height, heading and speed before requesting to break off the approach. ATC reported that they had no primary or secondary radar contacts and the instructor had no TAS contact, indicating that it was unlikely that the threat aircraft was squawking Mode A. As they marshalled for a further feed-in, ATC then reported a faint contact in the vicinity that the

threat aircraft was last observed, but the instructor could not correlate this return as they were no longer visual. Upon debrief, it became evident that the student had taken control as soon as they had seen the aircraft, it having 'bloomed' late in their visual scan. Worthy of note is that the threat aircraft was across the cockpit from the student and in a potential blind-spot behind the canopy bow. The instructor also noted that a new radar system had recently been installed at Cranwell, which it was known filtered out low-speed contacts. Along with the lack of SSR return or TAS contact, this may have contributed to their lack of SA on the threat aircraft. Had the inexperienced student not taken control of the aircraft from the QFI, [separation at CPA] would almost certainly have been closer and the incident possibly more severe. Following debrief, it was possible that their actions were influenced by MAC being highlighted as a top threat, and their right to take control being highlighted as a mitigation, in the pre-flight outbrief.

**The Shadow Pilot** reported that they believed the Airprox may have occurred

as they entered the visual circuit for Hougham airfield, but that they did not see another aircraft.

**The Cranwell Radar Controller** reported they were also bandboxed Director/Departures due to lack of traffic. They had one aircraft on frequency in the [radar training circuit] (RTC) on Approach and one departure prenoted from Barkston and subject to a call-for-release iaw SOPs. The RTC aircraft was from Barkston and was inbound for a radar approach at Cranwell, which was using RW08RH. Once clear of Barkston overhead, they were turned onto a heading of 320° before descending to 1500ft Cranwell QFE for cockpit checks. An aircraft indicating level at 1000ft above was called and seen by the pilot when southwest of the centreline, northbound. There had been a contact north of the centreline which disappeared as the controller saw it. They turned the aircraft right onto 060° and carried out a handover to the PAR controller at Cranwell. They instructed the pilot to contact Cranwell Talkdown and a split second later the pilot reported taking avoiding action

on traffic left 10 o'clock, slightly above, converging. As the pilot called the traffic, a contact painted on radar briefly before disappearing again. The pilot informed them that they were calling an Airprox timed at 1349Z and passed a possible aircraft type. Having ascertained the position of the aircraft, they continued to vector for a re-feed in a safe direction, informing the pilot that they would keep them north of the centreline to avoid the last known position of the subject radar return.

**The Cranwell Talkdown Controller** reported they hooked and called contact on the Prefect at 8.5 miles. They identified the aircraft and gave their frequency. They had Stud 5 open to listen for the transfer. They heard the pilot on the frequency state that they had taken avoiding action and would be filing an Airprox. Before calling contact, the Talkdown controller noticed a return in the Glidepath and Azimuth. However, there had been multiple contacts that turned out to be 'chaff' during that session. They were not aware of flying activity occurring at Hougham.



### Prefect vs Shadow 18 Oct 22 Airprox No. 2022250

**The AW139 Pilot** reported that on the way out from Norwich to [destination] they were told about two fast-jets who were heading east towards 'Bacton'. They were given an avoiding steer to the west which put them clear. They became visual with one of the jets (above cloud) around the Bacton area. There was a Chinook helicopter below them around 'Sustead' which may or may not have been involved in a military exercise with the jets. They were VMC on top, but cloud was at various levels all over the area. At 1028, as they coasted out about 21NM from Norwich, at 3000ft, they had a TA "Traffic Traffic" caution on TCAS and observed the yellow contact on screen directly behind them, 300ft below, at a range of about 1.5NM. Norwich Radar then came on the radio and gave them immediate avoiding action to turn right onto 090°. A few seconds later they were told they were clear of the jet as it was climbing, and they were free to resume navigation to the north. They had since discussed the matter with Norwich ATC (who were super busy at the time) and discussed filing an Airprox. The pilot noted that they were grateful for ATC's instruction to turn, even though they were on a Traffic Service. After calling Anglia Radar on return to Norwich to see if they had any information, they said that their trace showed the fast jets passed 75ft above them at a range of 1.38NM. The AW139 was fitted with TA only and they believed a resolution advisory would have been generated if they had

had TA/RA. They opined it was certainly too close for comfort.

**The Typhoon Pilot** reported that they were a flight of 2 x Typhoons conducting helicopter affiliation training with [Chinook C/S] operating in Class G airspace, north of the Norwich Control Area overland between surface and 15000ft on RPS 1002hPa. Prior to the sortie, Typhoon 1 had informed Norwich ATC by telephone of their plan, and intended to work with Norwich Radar. However, once the Typhoons were on station the Traffic Service was provided by Swanwick(Mil). At 1020:14 Swanwick(Mil) reported traffic outbound from Norwich tracking northwest and requested [Typhoon C/S] to proceed no further west then their present position, this was approximately in alignment with the eastern edge of Cromer. [Typhoon C/S] accepted this lateral deconfliction and planned to execute the next intercept with [Chinook C/S] east of this restriction. At 1023:05 Swanwick(Mil) updated [Typhoon C/S] on the outbound traffic from Norwich, reporting that it was southwest of them by 8NM at 3000ft, tracking northwest, this placed the traffic still within the Norwich CTA. [Typhoon C/S] acknowledged. At 1026:30 [Typhoon 1 C/S] called a 'Terminate' on the final intercept due to weather and fuel. At 1026:41 Swanwick(Mil) passed an update on the traffic, but it was stepped-on by communication on radio 2 with [Chinook C/S]. [Typhoon C/S] did not acknowledge. At 1027:00 [Typhoon 1 C/S] called for [Typhoon 2 C/S] to re-join with them. At 1027:04 Swanwick(Mil) again tried to pass an update on the traffic, but it was stepped on by communication on radio 2 with [Chinook C/S]. [Typhoon C/S] did not acknowledge. At 1027:54 [Typhoon 2 C/S] targeted a radar contact tracking northwest, at 3000ft, coasting out 6.3NM away from [Typhoon 2 C/S] and proceeded to conduct a radar join on the track. At 1028:34 [Typhoon 2 C/S] locked the track. At 1029:16 [Typhoon 2 C/S] recognised visually that the locked track was not [Typhoon 1 C/S] and commenced a breakout. The breakout

was commenced at 8000ft [slant range] with a vertical separation of ~300ft and minimal lateral separation of ~6000ft (1NM).

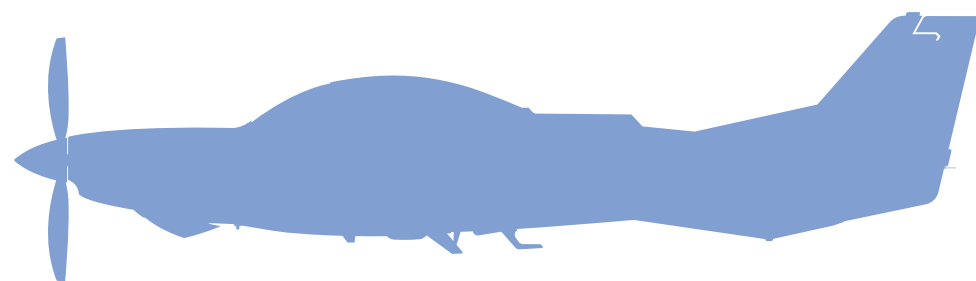
Contributing factors were: [Typhoon 2 C/S] had an equipment failure that resulted in no MIDS (Link 16) or A/A TACAN with [Typhoon 1 C/S]. [Typhoon 1 C/S] was fully synchronised to MIDS (Link 16) but was not receiving a surveillance picture, therefore provided no SA [to Typhoon 2] on [AW139 C/S].

**Typhoon 2's perception of their SA at time of Airprox:** The last intercept was terminated by [Typhoon 1 C/S] due to weather, which they estimated at around 7km visibility and a cloudbase of around SCT 2500-3000ft with the cloudbase decreasing further west. They had lost visual with [Typhoon 1 C/S] due to the cloud between them. Not having MIDS or A/A TACAN meant that they had no in-cockpit SA of [Typhoon 1]'s position. They requested a position report from [Typhoon 1 C/S] but did not hear a reply. They then mis-identified a radar track as [Typhoon 1 C/S] which was actually [AW139 C/S]. Due to the weather and visibility, they could see an object in the position of the radar track from approximately 5.5NM but could not identify it as not being a Typhoon until approximately 1.5NM. At which point they commenced a breakout. In addition to these factors, they also believed at the time that the traffic was no longer a factor as they had not heard an update on it for some time. However, on reviewing the tapes, they noted that Swanwick(Mil) did try and pass updates, but they were stepped-on by communications on radio 2. The breakdown in deconfliction likely occurred due to: poor weather, limited SA on [Typhoon 1 C/S]'s position, busy radios resulting in stepped-on ATC communications, and mis-identifying a radar track by not matching its speed and height to [Typhoon 1 C/S]. Lessons that they will take from this incident are: take extra caution when there is limited cockpit SA, have a formation contract for one member to prioritise monitoring ATC whilst the other prioritises the tactical

For the full report, see Airprox No. 2022250 on the Airprox Board Website.

### Spry's Comments:

An excellent example of how 'see and avoid' is still as relevant as ever. If the safety pilot wasn't present here, or if it was a single seat/solo pilot aircraft flying the approach, the outcome could have been very different. Modern primary Radar systems may filter-out slow-moving and low Radar cross-section contacts to create a workable and less cluttered picture for ATC. It's easy to allow lookout to degrade when receiving an air traffic service and scanning a TAS device. A disciplined lookout scan is likely to be the best means of avoiding a collision with a non-squawking aircraft such as a microlight. to give the participating glider pilots awareness of your presence. Transponders are not mandated for gliders so TAS or TCAS will not be useful here unless your platform has access to data from FLARM. ■



comm, and ask for an update on traffic if unsure of its position.

**The Norwich Controller** reported that at 1030 a Typhoon under the control of Swanwick(Mil) came within 1.5NM of an AW139, under the control of Norwich Radar, at the same level (3000ft). The incident took place 20NM north-northwest of Norwich airport. In the preceding hour the two Typhoons had been operating SFC-5000ft, north of Norwich, undertaking an exercise involving a low-level Chinook. Throughout that time, agreements had been made between Swanwick (Mil) and Norwich Radar for the jets to move either east or west, to vacate the area for arriving and departing North Sea helicopters. At 1017 [AW139 C/S] departed Norwich on a track of 342° and climbed to 3000ft on the Yarmouth pressure setting 1003hPa. Norwich Radar called Swanwick(Mil) who agreed that the two Typhoons would move 10NM to the east, and remain no further west than that position (roughly in the vicinity of Bacton). Traffic Information was passed to [AW139 C/S] on the Typhoons and it was suggested that the helicopter take up a northwesterly track to increase spacing further. Swanwick(Mil) Supervisor called Norwich Radar to suggest that the Typhoons be handed over to Norwich Radar and it was agreed that once Norwich Radar 2 position had been opened, this could take place. An attempt to hand over the Typhoons to Norwich Radar was made a few minutes later, but had to be abandoned due to Norwich Radar's workload. Traffic Information was passed to [AW139 C/S] as one of the Typhoons passed 3NM behind the helicopter, approximately 500ft below, before climbing to 5000ft. Shortly after this, at approximately 1030, the STCA sounded as one of the Typhoons closed to [AW139 C/S] from behind, descending through the level of the helicopter. Traffic Information was passed promptly followed by an instruction to turn right immediately onto an easterly track, in an attempt to deconflict the two aircraft. The Typhoon was then observed to make a sharp right turn so the AW139 was instructed

to return to a northerly track. During the incident, the Swanwick(Mil) Supervisor called to inform Norwich Radar that the exercise was complete and the Typhoons were returning to base.

**The Swanwick(mil) Tac Left Controller** reported they were controlling in the Mil East AOR working 3 aircraft during the time of the occurrence. A pair of Eurofighter Typhoons were operating in the block SFC-15000ft on RPS 1002hPa. The operating area was to the north of Norwich airport approximately 10-15NM working against a slow, low-level Chinook. The [Chinook C/S] was squawking 7360 under the control of Norwich Approach, who were aware of the Typhoons inbound to their AOR, as in a previous Traffic Information call Norwich had asked if the Typhoons were the ones conducting intercepts against the [Chinook C/S]. Throughout the session there were multiple requests from Norwich Approach for coordination with [Typhoon C/S] against all inbound and outbound Deconfliction Service traffic to Norwich. [Typhoon C/S] were very accommodating in agreeing to lateral restrictions, as vertical ones would have hindered their sortie profiles. Norwich called requesting further coordination against the two Typhoons for a departure squawking 4604 (AW139 C/S). The controller asked [the Typhoon C/S] to manoeuvre to the east by approximately 10 miles to facilitate the Norwich departure to the northwest. The pilots then requested that they wanted to work 20 miles to the north of Norwich due to the location of the helicopter target, to which the controller responded that the location was currently blocking the outbound departure lanes for Norwich. The pilots then manoeuvred to the east as requested. The outbound 4604 traffic was then called in relation to Norwich, and they then subsequently provided a second Traffic Information call on the aircraft, indicating it was northwest-bound indicating 3000ft. When this second Traffic Information was passed, the controller shifted their focus to another aircraft on frequency who

required handing over to Lakenheath Approach to conduct general handling. As they shifted their attention back to [Typhoon C/S] they had proceeded to manoeuvre west, fast moving. This then brought in 2 more conflicting aircraft inbound to Norwich. They called Traffic Information to the Typhoons for an aircraft that was co-level at 6 miles, they received no response and proceeded to re-call and ask if the pilot had heard the Traffic Information. The Norwich controller then called asking for a handover of the two Typhoons, and they began to handover [Typhoon C/S], on handover [Typhoon 2 C/S] began to track north. In the middle of the handover the Norwich controller cut them off and said they would call back. At this point they returned their attention to an aircraft they had at FL280 in CAS that required vectors throughout their sortie to maintain clear of the upper air routes, and issued them a turn. When they returned their focus to the Typhoon formation, the lead Typhoon reported complete, and they instructed both to report in standard formation at FL80. They did not notice [Typhoon 2 C/S] continue their descent and therefore did not see the occurrence. [Typhoon 2 C/S] did not report anything untoward on the frequency and the formation transited back to [destination] with no further issues.



**Spry's Comments:**

The airspace over East Anglia can be busy and is shared amongst a variety of military and civilian operators. Bristow Helicopters run a sizable operation out of Norwich and have started using CADS to raise awareness to military users. If given the luxury of choice, taking your training elsewhere can be easier than attempting to coordinate with multiple airspace users and ATC units. Asking Swanwick to liaise with a LARS provider can result in confusion and delay, so It's often best if at least one the pilot speaks directly to the controlling agency. ■

For the full report, see Airprox No. 2022178 on the Airprox Board Website.

# 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              | 01400 264551                                       |
| 3FTS                            | 01400 267536              | -                                                  |
| 4 FTS                           | 01407 762241 6666         | -                                                  |
| 6FTS                            | 01400 266944              | -                                                  |
| Air Cadets (RAFAC)              | -                         | 01400 267817                                       |
| 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              | -                                                  |
| 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 857380/95423 7380   | 01637 857162                                       |
| Syerston                        | 01400 264522              | 01400 264551                                       |
| Tactical Supply Wing            | 95461 7177                | -                                                  |
| Valley                          | 01407 762241 6666         | 01407 767800 / 7685                                |
| Waddington                      | 01522 726666              | 03001684954                                        |
| Wittering                       | 01780 416377              | 01780 417611                                       |
| Woodvale                        | 01704 872287 x 7306       | -                                                  |
| 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                | BFC-Aki-Safety-AssuranceSFSO@mod.gov.uk            |
| 83 EAG                          | 9250 060 451 3050         | 83EAG-AIROPFSFSO@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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