

Military-Civil Air Safety Day:



Sharing the air with minimum risk

*In a fascinating and informative day-long course that you can (and should) attend, the military seek to improve your safety, and theirs. **Pat Malone** reports*

Okay, so you've got a problem. You're down on power – a magneto's packed up, or something more sinister – and you're starting to hear strange noises... the oil pressure is falling, the two immutable laws of aviation, gravity and Murphy's, take control and you know it's time to get this machine on the ground before it all really turns to rats.

Here's the good news. The door has just opened onto some of the biggest, best-equipped and most congenial aerodromes in the country, where if you are genuinely in trouble you will be welcomed with open arms, shepherded by the slickest ATC, brought in on the most sophisticated approach and landing aids and placed gently onto a runway which, at a push, you could probably land across. Britain's network of military aerodromes is there for you if you really need it, and they want you to know it.

At a Military-Civil Air Safety Day at RAF Wittering at the end of September, military air

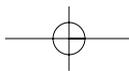
traffic controller Sgt Jason Ferguson of the Distress and Diversion cell said: "In case of trouble the safe conclusion of the flight overrides all other considerations, and the entire military network is at your disposal. Depending on the nature of the problem, we may choose to take you into a military aerodrome rather than a less well-equipped civil one, and you need have no qualms about accepting military hospitality."

Every MoD airfield in Britain has signed up to the 'Strasser Scheme' whereby all charges are waived in cases of genuine emergency. The idea of intruding on a busy and sophisticated aerodrome may seem strange to some, accustomed as we are to the sort of grudging, price-gouging treatment that general aviation gets from some provincial airfields when trouble forces us to seek safety there. Mark Stock, an AOPA member at the Safety Day, said: "I've always had military aerodromes in the back of my

mind as places to avoid at all costs, but it's good to hear them say that we really are welcome without reservation, and it's clear that they mean it."

AOPA's Channel Islands chairman Charles Strasser, who operates the Strasser Scheme, says: "It took me a long time to persuade the MoD to join the Scheme, but since they did so, we have had nothing but praise for the help and assistance they have given to AOPA members, and there has not been a single complaint to me from pilots who have had the need to use their airfields for genuine emergency or precautionary diversion landings."

Sgt Ferguson gave us an outline of the way the D&D cell works – see the February 2007 issue of *General Aviation* for a fuller description – and stressed some important points. 121.5 is there to be used, for practice pans and training fixes as well as for the real thing. During the day they have two controllers and two assistants on duty, and during the night, one of each, and they're available around the clock and around the calendar. They look after both civilian and military traffic, and London's influence stretches up to 55 degrees north – about the Scottish border – where Scottish control takes over. They're





Phillip Stevens

moving from West Drayton to Swanwick, probably in January.

On the military UHF side (the military distress frequency is 234 MHz) they have 19 radio receivers spread about the country and can triangulate on a problem aircraft virtually instantaneously on first transmission. They sit facing a massive board naming every military aerodrome with up-to-date information on weather, runway length, fire cover, facilities like arrestor wires, and frequencies, and from long experience they can make fast decisions on how best to resolve the situation.

On the civil 121.5 MHz side they have 16 receivers which give similar triangulation capability, and nine transmitters. They have instant access to all search and rescue assets, push-button access to detailed information on all civil aerodromes (and a copy of Pooleys in the drawer as a back-up), direct dial facilities to all emergency centres around the country, and they can play back radar traces to help in the search for missing aircraft.

Above all, they have years of experience of handling aircraft in difficulty and know the form better than you do. "Don't worry about the RT phraseology," Sgt Ferguson said. "Just say it any way you like – 'Umm, London, help' – and we'll know exactly what you mean."

Home of the Harrier

RAF Wittering is home to some 2,000 RAF, Navy and civilian personnel and its airspace is extremely busy, so if you're heading that way give their LARS a call on 130.2 in good time. They'll be pleased to hear from you, and you can bomb on through their patch following the A1, a great aid to VFR in those parts.

Wittering is a long-established air base, older even than the RAF itself. It began life in 1916 and has been in continuous use since. Being slightly north of the most active airspace during the Battle of Britain it was used to rest squadrons on rotation, and later in the war captured enemy aircraft were all flown from Wittering. It was home to elements of the V-force after 1955, with Victors, Valiants and latterly Vulcans being based there. In 1969 it became the 'Home of the Harrier' and it remains so today.

Pilots graduating from Hawks at Valley go to Wittering to learn to fly the Harrier with 20 Squadron. These are GR9s, with composite wings and a good turn of speed – the Rolls Royce Pegasus is the same engine that powered the 1969 Harrier, but in name only. Thanks to modern materials and technological advances it now delivers 23,000 lbs of thrust, giving its pilots an advantage in hot and high spots like Afghanistan, where the earlier marks used to puff a bit.

Since 2006 Wittering has been Britain's Expeditionary Logistics Hub, providing support services to our forces in Iraq and Afghanistan, and the station commander, Group Captain Rowena Atherton, is a logistics expert.



Left: a Tornado, fast and low - and just about to spoil your whole day
Above: RAF Wittering, 'Home of the Harrier' with its chained-down gate guardian

They will vector you to the nearest or best airfield, but if you're low down you might not be heard. You'd need to be at 2,000 feet within 40 nm of Heathrow for good reception, and 3,000 feet beyond that. And 121.5 is not just there to resolve problems but to prevent them. "Call us up if you think you're getting close to controlled airspace," Sgt Ferguson stressed. "Don't wait for situations to develop. We can help you head them off."

The number of practice pan calls received by the D&D cell has finally shown an uptick, following years of decline. "Don't be reticent about using us for training purposes either," Sgt Ferguson added. "It's good for you, and it's good for us because it helps in the training of controllers."

A few more important points: If you buy an aircraft or a used ELT, re-register the ELT in your own name. If you are expected at an airfield and decide to go elsewhere, tell them. D&D spends hours looking for 'lost' aviators who are sitting in bars. When you fly, let someone know where you're going and what your endurance is. "There have been cases where aircraft have gone down, and many hours have elapsed before anyone's realised they're missing," Sgt Ferguson said. "It could make the difference between you being found

alive in the evening and dead in the morning. Tell somebody, and give us an idea of where and when to start looking.

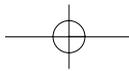
"Finally, remember we're here all day, every day if you need us. We'll find you an airfield and get you down. If you're in any way worried, call us up – we'll take you where you need to go, and get you home safe."

LARS

RAF Wittering air traffic controller Flt Sgt Dave Allen stressed that they want to hear from you not just in an emergency but whenever you're in their neighbourhood. It's not like trying to get an information service from Stansted – the military wants to know who you are, what you're about to do, and in particular, what height you're going to do it at. (See sidebar on Mode-C).

The LARS at Wittering comes off Cottesmore's radar, and as we all know (?) covers airspace up to FLO95, either 30 or 40 nm from the station, and between the hours of 8am and 5pm on weekdays. Sometimes it's 2pm to midnight when they're night flying.

Flt Sgt Allen outlined the three main services provided by LARS (and soon to be superseded, probably next year, by a clearer system). A Radar Advisory Service (RAS) provides you with advice "designed to achieve prescribed separation between participating aircraft." You'll be given the bearing, distance and level of conflicting traffic and advice on how to resolve. RAS is only available to IFR traffic as you may be vectored into IMC. ATC's intention is to maintain clearance of 5nm and 3000



feet. One word of advice from Dave Allen – don't ask for a RAS on a beautiful clear day when everyone's flying because you'll be taken all over the sky for traffic avoidance. RAS instructions are not mandatory, but pilots must advise ATC before changing heading or level. The pilot remains responsible for terrain clearance.

The next level down, Radar Information Service (RIS) means a pilot will be informed of the bearing, distance and level of conflicting traffic, but not given advice on avoidance. Separation remains the pilot's responsibility. Again, pilots must advise ATC before changing level or heading. Pilots remain responsible for terrain clearance.

Then we come to the Flight Information Service (FIS) for which Wittering gets hundreds of requests every week. For a FIS, radar is not necessary, although you may be asked by Wittering to squawk ident for co-ordination purposes – in their area, the 3720 code may be requested. ATC will pass information "useful to the safe and efficient conduct of flight". Other known traffic will be passed to a pilot if a potential conflict arises.

You almost always get more than you ask for. Even on a FIS, the controller may suggest a heading for avoidance. Nobody's going to watch a situation develop without offering a resolution simply because the pilot hasn't



Left: Air traffic controller Dave Allen - 'Drop in any time you're in trouble'

asked for one. The controller is not even required to keep you clear of an ATZ, but you'll usually find he or she will do so, unbidden. Don't bank on it, though.

Wittering's LARS abuts Stansted airspace, and it's clear from informal contact with many military controllers that they share general aviation's opinion of the civil controllers at such airfields. Flt Sgt Allen was not inclined to be drawn on the subject, but he did say: "Our bread and butter is LARS, theirs is the flow of commercial air transport – we can try to hand you over, but they may be too busy."

Coventry, he said, is expanding all the time,

and it's always worth giving them a call if you're in that area. "At present they have a small zone and they're not a LARS unit but they do ask us to pass traffic on to them and they're getting more and more commercial traffic, so it's in your interests."

If you want a MATZ crossing, plan ahead and call early. "Usually it's absolutely no problem, but you can help yourself," Flt Sgt Allen said. "Look at the wind, consider what runways they might be using. A good height would be 2,000 feet to give separation from circuit traffic at 1,500 feet, but if you can't make 2,000 feet we'll still fit you in."

Co-ordination is an agreement between ATC units when you're being handed on, so if you hear "for co-ordination maintain 3,000 feet" or whatever, it's because the next unit wants you there. "And keep your eyes open," Flt Sgt Allen said. "We can't guarantee separation, so even if you're under a RAS don't drop your guard."

Airprox avoidance

Peter Hunt, Director of the UK Airprox Board, explained the workings of the Board and stressed that it was there to make sure the lessons of airproxes were learned, and not to

Don't be collected in a bucket

The CAA's David Cockburn is familiar to most of us, and ought to be familiar to all of us – if you haven't been to one of his Safety Evenings, *you owe it to yourself to go*. In a departure from his Safety Evening form he took us through the anatomy of a single accident which befell a Piper Cheyenne en route from Zweibrücken to Athens. Although the flight was scheduled to cross the Alps, the high ground did not figure in the accident as most of the aircraft was gathered up in buckets within a few miles of the aerodrome of departure.

This was a delivery flight to a new owner, and the pilot was experienced. In his late 60s, he held an ATPL and a valid medical, and had been type-rated on the Cheyenne for 20 years. The airfield of take-off was suited to the business – it had a 3000-metre runway, with a VOR on the field and an ILS if he wanted to come back. The fuel tanks were full, and everything was ready for departure.

Except that the pilot couldn't close the door. This was a new mark of Cheyenne, different from that with which he was familiar. An engineer showed him how the door worked, and realising he was unfamiliar with some of the kit, started the engines and ran through some of the avionics for the pilot's benefit. He stopped the engines in order to get out, but had to be called back when the pilot couldn't start them again. The ignition switches were in the overhead panel.

The aircraft departed and climbed out on a Standard Instrument Departure, but started drifting left of track. Radar asked to have him passed over, but the Tower was told: "I have a problem. Stand by." The aircraft began descending and its track was all over the place. It hit the ground at high speed and the pilot was killed.

Little is known, but much can be surmised.

Right: the CAA's David Cockburn, proudly sporting his AOPA tie!



While he was type rated and experienced, the pilot was clearly unfamiliar with the mark, as his inability to shut the door or start the engines indicated. He was apparently unable to change frequencies, perhaps bamboozled by an unfamiliar radio.

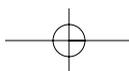
"Known your aircraft and equipment," said Mr Cockburn. "It's no time to learn about your aircraft, when you're in trouble. Remember the basic mantra – aviate, navigate, communicate."

Why did the pilot attempt the flight without getting a briefing on the kit? Who knows. It's possible he was under some commercial pressure to deliver the aircraft. The secret goes with him to his grave.

Mr Cockburn said the CAA wanted to codify a differences training syllabus and enshrine it in law, but were overruled at European level. All I can say is thank heavens for Europe. The CAA must learn that more regulation (and the associated cost) is not the answer. Unless you tailor a bespoke course to every pilot, you cannot address his needs. Every pilot should accept responsibility for his actions. The CAA is doing the right thing in advising pilots of the need to understand their kit. The rest is, and should remain, up to the pilot.

While on the subject of the Alps, Mr Cockburn noted that more UK pilots were venturing further afield in more capable aircraft and finding themselves in high mountains which behaved differently from the hills we are used to in Scotland and Wales.

"There's a lot to think about, and you shouldn't go there until you have thought about it," he said. "Are you conversant with orographic cloud, airflows up and down hills, lee waves, some with rotor streaming turbulence, fohn effects, valley winds? If you're being forced high, what are the performance limitations of your aircraft? Manoeuvrability decreases, TAS increases, so does inertia. In particular, what are your own performance limitations? You might think you can go to 14,000 or 16,000 feet for short periods, but even at 10,000 feet a lot of people need oxygen to think straight."





The case for low flying

The uniquely 'military' aspect of the day largely covered low flying, which is where general aviation and the military most often come into conflict. Flt Lt Antonia Ball of the Low Flying Operations Squadron at Wittering explained how low flying is planned and executed, and how restrictions are enforced.

Low flying, she said, was considered to be a highly perishable skill. If a military pilot had not flown low for 30 days he or she would have to take a check ride; after two months, recertification would be required. Low flying took place between ground level and 2,000 feet, and normal cruise limit is 450 knots, with 550 knots allowed under certain circumstances – and it's all done on "see and avoid".

A video designed to show why low flying was necessary was shown, but I thought it made a poor case. It concentrated largely on helicopters, which it said were exposed to cheap and unsophisticated small-arms fire for shorter periods if they flew low. But small arms have a limited range, and height would seem to be an asset in the absence of sophisticated anti-aircraft weapons. As for fast jets, it was pointed out that the Americans were cured of low flying in Vietnam and invested instead in electronic suppression, for which low flying was a cheap and ineffective substitute. Britain should have undergone the same cure in the early days of the first Gulf War, when nine Tornados were lost, seven of them British, while the F-15 Strike Eagle, the nearest American equivalent in terms of tasking, lost none.

The military reply was that only one of the lost Tornados was shot down at low altitude – the rest were lost for various reasons (including, unsurprisingly, CFIT). They added that low flying over a conflict area was a 'show of force' which deterred the other side from attacking, but putting your assets and your people at risk for such an amorphous return seems questionable. In the final analysis, the military men at the MCASD were keen to stress that they don't do it for the hell of it, and that if it wasn't valuable and necessary it would long ago have been abandoned.

Undoubtedly low flying sharpens piloting skills, and perhaps that is its best justification in the absence of a national will to provide the RAF with meaningful electronic suppression equipment.

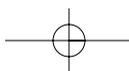
At the end of the day we were all able to sit in the cockpit of a Harrier GR9, which is a pretty tight fit for a middle-aged gentleman. It has a fascinating array of screens, buttons, dials and sticks – the most interesting thing to me was the fact that the throttle lever and the thrust vectoring lever are both at your left hand, which must juggle between the two. But the abiding impression is of an aircraft that doesn't have a fantastic forward view. Even though the nose slopes down and there's a HUD, the view is severely restricted. The chances of spotting a small white Cessna when you're hugging the earth at 500 knots must be somewhere between slim and none. My friend Robbie Reid was killed when a Tornado hit his JetRanger from behind while he was on pipeline patrol, and the Tornado pilot thought he'd hit a bird. You can't blame the Tornado pilot – the question of whether "see and avoid" works in these circumstances is moot. Personally, I don't think it does.



Phillip Stevens



Above: fast jets like this Eurofighter Typhoon can fly low at up to 500 knots
 Left: Harrier GR9 cockpit - even with the HUD, there's a lot to look at on the inside
 Below: AOPA member Mark Stock shows how the HUD frame impinges on the field of view



apportion blame. An airprox, he said, happened when a pilot or controller thought safety had been compromised – third parties could not file airproxes. Mr Hunt illustrated his talk with alarming video of airproxes taken from military aircraft, some of them only split seconds from disaster. The only reason there weren't any civil ones in there, he said, was because civil aircraft don't have a video camera in the nose.

The Airprox Board is a joint military-civil organisation, run by the MoD and the CAA on a 50/50 basis. It's made up of a vast number of people with intimate knowledge of aviation, civil, airline, GA, helicopter, gliding, military or ATC. The Board determines what happened, decides on the causes, assess the 'risk', and initiates safety action.

There are three categories of risk, with the greatest being Category A, which comprises ten percent of reports. Thirty percent go into Category B, and the remaining 60 percent into Category C, where there was no risk of collision. The Board's safety recommendations go to CAA, NATS, the MoD or whoever might learn from them, and 90 percent of them were accepted by those who were deemed able to improve the situation.

The Board leans over backwards to dis-identify reports, even down to blurring gender, and strives to be impartial, fair, and technically accurate.

Mr Hunt produced a graph of the heights at which airproxes were reported. There were notable spikes at 500, 2000 and 3000 feet, with a particularly strong one at 2,000 feet. It may be worth, Mr Hunt said, vertically offsetting slightly from 2,000 feet in order to reduce the risk of conflict. But the primary rules were to maintain a lookout, turn your transponder on, Mode-C if fitted, talk to ATC, and understand ATZs and service levels.

For more information and to get up to speed on some of the Airprox Board's recommendations see their website www.airproxboard.org.uk

Change in the air

Royal Navy Cdr Paul Brundle of the Defence Aviation Safety Centre concluded proceedings

Come and join us!

The Ministry of Defence sets great store by the Military-Civil Air Safety Day, which gives them a rare opportunity to address general aviation with their particular concerns. It's quite remarkable how many military aviators are also GA pilots, whether in fixed-wing, gliders, or as spare-time helicopter instructors, so we all talk the same language most of the time.

The MCASD at Wittering was organised by RAF Squadron Leader Simon Brook and attended by Royal Navy Commander Paul Brundle of the Defence Aviation Safety Centre, together with Air Commodore Ian Dugmore, the new Director of Military Aviation Regulatory and Safety Group. Also on hand was Wing Commander Dan Stellmacher, number two at RAF Wittering, David Cockburn of the CAA's Safety Regulation Group, and Peter Hunt, the former Trident captain who is now Director of the UK Airprox Board. As Sqn Ldr Brook said: "MCASD is for the benefit of the general aviation community and its purpose is to further understanding between military and civil aviators. We all share the airspace, and it's vitally important we understand each other."



Sqn Ldr Simon Brook, a staunch defender of low flying

All in all, this was a worthwhile experience for any GA pilot and it's worth chewing your own arm off to get away to one of these events. The give-and-take nature of the discussion helps the military understand GA's viewpoint, which they consider to be invaluable.

with a final safety message. Cdr Brundle is a military representative on the Airspace Safety Initiative (ASI) Communications and Education Programme (ACEP) team that is responsible for publicising any changes brought about by the ASI working groups. These groups are hard at work looking at all aspects of airspace and how we share it, identifying risks and how to mitigate them. The NATS initiative to establish

a London area LARS is included in the ACEP, and there will be more radical proposals in the near future. The ASI draws together several working groups who are looking at different aspects of airspace safety and encompasses the ATSOCAS review, which as the acronym suggests is looking at all air traffic services outside controlled airspace. Cdr Brundle said (as reported in October's *General Aviation*) that RAS, RIS and FIS were likely to be superseded by a less complex structure, and the change would probably come in 2008. One of the greatest difficulties was to get the message out to the 'backwoodsmen' of general aviation, who don't belong to organisations like AOPA and who operate independently, often from private strips. If you know such a person, bring them into the loop. Safety systems can't work until everybody knows what's expected of them. ■

For pity's sake, squawk!

The man from the Airprox Board, the air traffic controller, the CAA safety expert, the military men all said the same thing – if you've got a transponder, turn it on, altitude mode if you have it. You can make few greater contributions to your own safety than having a working transponder, preferably Mode-C.

There is a widespread and unfortunate perception in GA that the transponder is an instrument of CAA retribution, more likely to get you into trouble than out of it. This has its roots in the notorious Elvington case in 2003 when four aircraft infringed a Red Arrows display, but the CAA prosecuted only one pilot – the least culpable – because he had his transponder on and was thus the only one they could catch. AOPA warned then that throwing the book at him would have serious safety implications, and we have been proved right. At a recent seminar on infringements, well-known examiner Irv Lee said that 50 percent of the instructors and even examiners he flew with failed to turn on their transponders.

But at the same seminar, the CAA's head of enforcement Ian Weston pointed out that a pilot who had his transponder turned on would be considered by the CAA to be a more responsible aviator than one who did not. In case of infringement, having a working transponder would militate against prosecution, rather than facilitate it.

It is true that since the Elvington case, no pilot has been prosecuted for an infringement in similar circumstances, and the advice to pilots from all quarters is to turn on your transponder, Mode-C if you have it. Airprox Board Director Peter Hunt said: "A transponder that is not switched on is like fuel in the bowser, runway behind and altitude above. Wherever you are, you're better off squawking."

TCAS systems need transponders to operate, and that in itself is enough reason for you to turn yours on. Why not add a 'T' to the end of your FREDAs and make sure your transponder is on, and that you have changed codes if necessary when changing radio frequencies? With the increasing use of local area codes like 1177 for London Information, 0013 for Luton/Stansted and 7366 for Manchester, leaving the old code up after you've changed frequency is going to become an increasing problem.

Below: pilots at MCASD were shown around the Harrier hangar and given an insight into operational flying

