

VECTOR

Pointing to Safer Aviation

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CRASH SURVIVAL

In our earlier *Vector* article on forced landings, we dealt with how to put the aircraft down in "difficult terrain". What then can you do about minimising your chances of injury – improving your chances of survival – during the aircraft deceleration? The following should be of particular interest if you regularly operate in, or over, rough terrain. It suggests a few basic rules to stick to, and it discusses what your priorities should be when evacuating passengers from the aircraft wreckage.

Crash survival is not a topic that many pilots care to talk about too often. It is difficult to imagine how you might deal with a forced landing in mountainous terrain, for example, where suitable landing sites are limited, search and rescue options are bleak, and weather conditions are unfavourable. Maybe you have no other alternative but to fly over mountainous terrain to get to your destination; maybe you simply have to operate in rough terrain as part of your job. Regardless of why you are there, it is important that you put plenty of thought in to how you might survive a forced landing in such circumstances.

Impact Protection

The deceleration forces associated with a crash landing in rough terrain are probably going to be large (typically anything from 20 to 100 G), so it is important to be well prepared to handle them.

Once you have planned your approach to a landing site, and have completed as many of the forced-landing checks as you can, then it is important that you and your passengers turn your attention to doing everything possible to protect yourselves from what could be a heavy crash landing.

Seat Belts

One of the most critical things to do is to ensure that everyone's seat and



Photograph by John Martin courtesy of N.Z Wings magazine

*"...deceleration forces...
 are probably going to be
 large... anything from
 20 to 100 G..."*

shoulder restraints are as tight as possible. Particular attention should be given to shoulder straps, as they can often become very loose, or even slip off altogether, which significantly increases the chances of receiving serious head and neck injuries. It is all too easy to overlook this small but vital point during the extremely high workloads that are often imposed upon the pilot during a forced landing. And it is the pilot who is the person responsible for ensuring that everyone does have their straps tight.

Head Protection

Protecting the head during an impact is extremely important, and it will help reduce the chances of a serious blow to the skull that could render a person unconscious – this can quickly become fatal if the aircraft catches fire afterwards. It is in such an emergency situation that the wearing of a safety helmet, and any other protective clothing, would be a major advantage.

Unfortunately, such a practice is not particularly common within general aviation – with the exception of helicopter and agricultural pilots. Undeniably, wearing a safety helmet will provide the best possible protection during a sudden forward deceleration, and it may be a worthwhile asset to invest in – if you think that the type of flying you are doing exposes you to such risks.

Continued over...

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Next Issue

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Emergency Equipment

It is always going to be important that your passengers know – before the landing takes place – where the first-aid kit, fire extinguisher, and axe are located. You should, of course, have already given them this during the briefing before flight, and during the passenger briefing section of the forced landing drills. If for some reason you have omitted to, then quickly run them through these details – because they may need any one of these items very shortly.

Doors

Door latches should be unlocked in order to minimise the chances of the locking mechanism becoming damaged during an impact, to the point where the door is unable to be opened.

Loose Objects

If possible, instruct your passengers to secure any loose items that you know will be dangerous during an impact. Heavy items that are behind people are the most dangerous.

Brace Position

The brace position, in conjunction with any padded items that are available, will not only help cope with deceleration forces, but also minimise injury from flying objects within the cabin.

Just before impact, instruct your passengers to assume the brace position.

Back-seat passengers should place both hands over the top of their head, which should then be firmly positioned against the seatback in front of them. This will **significantly reduce** the level of deceleration that their upper body is likely to experience. In addition, you should instruct your passengers to protect their upper bodies with any readily accessible soft items that will further minimise these forces.

Some studies have indicated that placing your head between your knees, while holding onto your ankles, will reduce the chances of receiving serious leg injuries. It does this by preventing your legs from suddenly extending forward as the aircraft decelerates more rapidly than your body does. This may work quite well during large-aircraft crash situations, where deceleration forces are usually not as large, but is perhaps not so effective in lighter aircraft. We suggest that your back-seat passengers tuck their feet as far back as possible under their seat to minimise the chances of serious leg injuries. Why this concern with leg injuries? Serious ones might prevent a person from vacating the

aircraft quickly enough – or at all.

For the pilot and the front-seat passenger, it is somewhat more difficult to assume this type of brace position – due to the upper body movement being restricted by shoulder straps (either fixed position or inertia-reel types). But you should at least double-check that your straps are **tight**, that your inertia harness (if applicable) is locked in position, and that your seat is locked in position.

If you are not wearing a helmet, it is certainly worth shielding your head and face by placing your hands over the top of your head just before impact. Your front-seat passenger will probably want to do this slightly before you, as they do not have to fly the aircraft.

*“Well clear means ...
that if an explosion does
occur no one will be struck
by debris or sprayed with
burning fuel.”*

If for some reason your aircraft does not have shoulder restraints, then the brace position for the pilot involves placing one hand (or arm) over the top of the head while resting it on the top of the aircraft instrument panel. This should help reduce the likelihood of neck injuries by minimising the movement of your head relative to the rest of your body – which is restrained by the lap-strap harness. Even though you are in the brace position described, you should still be able to manipulate the yoke or stick and rudder pedals during the last few seconds of flight (if it is apparent to you what control movements are required to achieve the best possible touchdown). Note that placing a soft item of clothing, or a seat cushion, on the edge of the instrument panel will further soften any impact forces.

It is vital that you remember to give the instruction to your passengers to “brace! brace!” (as per the safety brief that you gave them before the flight) at the appropriate time – especially if you know that the landing is going to be a rough one.

Exiting the Aircraft

Once the aircraft has come to a stop, it should be abandoned as quickly as possible because of the risk of fire. If it proves difficult to exit the aircraft because it is badly damaged, then go straight for the axe and smash your way out. If you can



Photograph by John King courtesy of N.Z Wings magazine

position yourself to do so, a swift boot with your foot may be effective. Before exiting, make a **very quick assessment** of whether you have time to grab items like the first-aid kit, warm clothing, food, and the ELT – as long as they are not going to hinder your progress. These are all very useful items to have, but certainly **not** at the expense of someone getting severely burned.

Assuming that you are not badly injured, you – as the pilot in command – are responsible for ensuring that you make every effort to get your passengers out of the aircraft in the shortest possible time.

It is important that you do this quickly, even if some individuals are badly injured, because of the fire risk. Badly injured passengers will probably need to be carried, or even dragged to safety.

If a fire has started, do not waste time trying to extinguish it, but get everyone out and instruct them to stand **well clear** of the aircraft. Well clear means far enough away from the aircraft that if an explosion does occur no one will be struck by debris or sprayed with burning fuel. We give this advice because you have **absolutely no way of predicting** how a fire will spread – it could become a sudden explosion

that would more than likely be fatal.

The same amount of caution should be applied to going back to the aircraft to try to put out a fire, even though you have all the passengers well clear. It is not a good idea to get close to a burning aircraft wreck to operate a hand-held fire extinguisher; a small fire may suddenly turn into a big one and engulf you in flames.

Once clear of the aircraft, do not go back to the wreck to claim anything, unless you are **100 percent confident** that fire does not pose a hazard – it is not worth the risk.

Summary

The ability to remain calm, and to keep your passengers calm through decisive leadership, will have a significant affect on the outcome of a crash landing in rough terrain. If you can do this, plus stick to the basics mentioned in this article, then you and your passengers stand a much better chance of surviving a crash landing. Having a good understanding – now – of what to do will help you to react quickly to take control of the situation. It could make a significant difference. ■



Safety Seminars

This year's series of safety seminars is well underway. The theme this year revolves around maintenance requirements and responsibilities and is applicable to general aviation pilots, operators, owners and engineers.

The focus is not upon the specifics of how to do particular maintenance but is upon the critical framework of rules, requirements and responsibilities that exist between pilots, aircraft operators, owners and engineers in order to achieve compliance and high safety standards.

Achieving a high standard of maintenance is a function of good plant, good planning and good decisions. The seminar looks at the ingredients to assist this and highlights the relationships that exist between engineer, owner, operator and pilot to achieve serviceability and safety. The roles and responsibilities of all the participants are explored.

If you fly, operate or own an aircraft, then this seminar is pertinent to you.

The seminars will be presented by Owen Walker, CAA Field Safety Adviser (Engineer), and he will be assisted by industry engineers.

While we will continue with the separate Heli-Kiwi and Aero-Kiwi titles, we emphasise again that you can attend either type of seminar – the topic is universal.

Aero-Kiwi Seminars through to mid November are listed below. Further seminars are planned in late November for **Ardmore, Nelson, and Greymouth.**

Safety Seminars

Sun, 13 Sep, 9.30 am – 12.30 pm

Aero-Kiwi Seminar. **Feilding**
Aerodrome, at Feilding Aviation Ltd.

Tues, 15 Sep, 7 pm – 10.00 pm

Aero-Kiwi Seminar. **Wanganui**
Aerodrome, at Wanganui Aero Club.

Tues, 29 Sep, 7 pm – 10.00 pm

Aero-Kiwi Seminar. **Christchurch**
Airport, at Canterbury Aero Club
(west side of airport).

Sat, 10 Oct, 9.30 am – 12.30 pm

Aero-Kiwi Seminar. **Masterton**
Aerodrome, Wairarapa and Ruahine
Aero Club.

Tues, 13 Oct, 7 pm – 10.00 pm

Aero-Kiwi Seminar. **Hastings**
Aerodrome, Hawkes Bay & East Coast
Aero Club.

Sat, 17 Oct, 9.30 am – 12.30 pm

Aero-Kiwi Seminar. **Hamilton**
Aerodrome, Waikato Aero Club

Sun, 18 Oct, 9.30 am – 12.30 pm

Aero-Kiwi Seminar. **North Shore**
Aerodrome, North Shore Aero Club

Thurs, 22 Oct, 7.00 pm – 10 pm

Aero-Kiwi Seminar. **Tauranga**
Aerodrome, Tauranga Aero Club.

Sun, 1 Nov, 9.30 am – 12.30 am

Aero-Kiwi Seminar. **Timaru**
Aerodrome, South Canterbury Aero Club.

Sun, 15 Nov, 9.30 am – 12.30 pm

Aero-Kiwi Seminar. **New Plymouth**
Aerodrome, New Plymouth Aero Club

Night VFR

A Guide for the Recreational Pilot

Night flying is not only fun and rewarding, but it adds a whole new dimension to the art of VFR flying. It sharpens your skills and ability as a pilot, and is useful experience to have if you ever unintentionally get caught out in the dark. With the introduction of Civil Aviation Rule (CAR) Part 91 in April of last year, night VFR requirements changed – in particular the requirement to remain within a 25 nautical mile radius of a lit aerodrome at night. This article deals with the requirements under CAR Parts 61 and 91 for operating VFR at night, and also provides advice on setting your own personal minimums to ensure you stay 'within the limits' on your next local or cross-country night VFR flight.

Night Requirements (Part 61)

Experience

CAR Part 61 requires that you have at least two hours simulated instrument flight time before you begin night training. It also requires you to have at least five hours night flight experience, of which two hours must be dual instruction and two hours pilot-in-command, before you can be signed off by a suitably qualified instructor as having met the night PPL requirements. This will then allow you to carry passengers at night (refer to Advisory Circular AC61-1 Subpart D for details).

Most pilots tend to commence their night training after they have gained a private pilot's licence and have had a chance to consolidate their experience by building up some pilot-in-command flight time.

Currency

In order to be able to carry passengers at night, you must have completed three pilot-in-command takeoffs and landings at night in the previous 90 days, and be current by day, or night, in the aircraft that you wish to fly at night (see rule 61.37(c) for details). These are minimum requirements only, and we suggest that the more night takeoffs and landings you can do, the more confident you will feel – especially when it comes to carrying trusting passengers.

Night Limitations (Part 91)

There are a number of limitations that are imposed upon night VFR operations that are designed to increase your safety margins. These are outlined below:

Night VFR Minima

Night VFR meteorological minima **greater than** those prescribed for normal daylight operations apply in the following situations:

- **Control Zones (CTRs).** When operating at night within class C or D control zones you must have a cloud ceiling of not less than 1500 feet and a visibility of not less than eight kilometres. (Note that the present visibility requirement is likely to be reduced from eight kilometres to five kilometres in the not too distant future.)

- **Uncontrolled Aerodromes.** When operating in the circuit at an uncontrolled aerodrome at night you must have a cloud ceiling of not less than 3000 feet and a visibility of not less than 16 kilometres. These requirements are significantly greater than those prescribed for a CTR where Air Traffic Control (ATC) is available to separate you from other traffic and monitor the weather conditions. (These night minima requirements are also likely to be reduced to a cloud ceiling of not less than 1500 feet and a visibility of not less than eight kilometres in the very near future.)

Note that for all other night operations in Class C, D, E, and G airspace the normal VFR minima apply. These minima can be found in the Operations section of the VFG or IFG.

Fuel Requirements

CAR Part 91.305 (a) requires that you have at least 45 minutes of useable fuel in reserve when operating night VFR instead of the normal 30 minutes required during

the day. The more fuel you can have in your tanks when flying at night the better – especially if weather conditions change.

Aerodrome Lighting Requirements

CAR Part 91.127 (b) also requires that you conduct all night flying operations from an aerodrome that is equipped with an operative lighting system that is appropriate to the type of aircraft that you are using and that the lighting is activated.

Minimum Equipment

In order to be able to fly at night, CAR Part 91.511 (a) requires your aircraft to have:

- Position lights (red, white, and green navigation lights);
- An anticollision lighting system (strobe lights, and/or a rotating beacon) – except that if you determine that, because of operating conditions (eg high levels of reflectivity from cloud or the ground when manoeuvring), it would be in the interests of safety to turn them off.
- The means of indicating rate of turn and slip; and
- An illumination system for each instrument or indicator that is required for the flight.



Distance Limit Removal

In the past you could only fly five nautical miles from a lit aerodrome, but this was increased to 25 nautical miles in 1985 to allow greater flexibility of night operations. With the introduction of CAR Part 91 in April last year, there are now no limitations in relation to the distance that you can fly from a lit aerodrome at night.

The removal of this limitation has now made night VFR cross-country flights away from your home base more of a reality. You can now plan, and complete, sizeable night cross-country flights to a wide range of locations that were not physically accessible before – provided that you comply with Part 91 requirements while doing so.

Night VFR – The Dangers

The removal of the 25 nautical mile distance limitation has certainly added an exciting new dimension to night VFR cross-country, **but** it can present traps for the unwary, or inexperienced pilot, as the following extract from NASA's January 1996 Aviation Safety Reporting System publication *Callback* illustrates:

An early evening flight almost became a “graveyard” flight for this non-instrument rated pilot, who met clouds and darkness at the same time.

I left later than I originally intended. In retrospect, I should not have left at a time that would require night VFR flight, given the cloud conditions. When I came upon a large cloud front ... I tried to climb over it, but soon elected to descend below it. I did not notice entering IMC at first, and, in fact, remember being curious why the anticollision lights were illuminating the cockpit and causing a strobe effect on the propeller. Shortly thereafter, I noticed that the turn coordinator was pegged in a left turn, the attitude indicator showed a 45-60 degree left bank, the directional gyro was spinning rapidly ... and the airspeed indicator dropped to 60 knots, then to zero. I recognised the signs of an impending “graveyard spiral” and was able to return the aircraft to straight-and-level flight. The real cause of this incident was lack of appreciation of the dangers of night VFR operations.

Night VFR can present a number of problems that may quickly become hazardous if the pilot is inadequately prepared to deal with them. These problems might include:

- Navigation difficulties leading to disorientation;
- Inadvertent entry into Instrument Meteorological Conditions (IMC);
- Failure to detect changes in weather conditions, eg a lowering cloud base or the formation of fog;
- Visual illusions that result in flight into terrain;
- Loss of height perception relative to the runway during landing; and
- The inability to select a forced-landing site during an emergency situation.

Many of the risks that are presented by such problems can, of course, be reduced to an acceptable level through proper training techniques and a thorough understanding of night human factors.

Night VFR Techniques

We suggest that you might like to consider the following points when planning your next night VFR cross-country or local night flight, which should help improve your personal safety margins and reduce the likelihood of finding yourself in an unsafe situation – especially like the sticky one reported above:

Background

- Be familiar with CAR Part 91 requirements for operating at night.
- Be fully conversant with night human factors. The ‘black hole’ effect, ‘break off’ phenomenon, auto-kinesis, and night vision adaptation are just a few concepts that you should be familiar with. Your instructor will have provided you with a thorough briefing, and extra background notes, on human factors as part of your night training. If you still feel that you require additional information, your local training organisation will probably be only too happy to help with locating any other night human factors reference material that is available.
- Make sure that you are current at night in the type of aircraft you wish to fly. You should be familiar with the cockpit control layout such that you can locate them ‘by feel’ – but be sure to do a visual check as well. Decide whether you think you have sufficient experience to undertake the flight you are about to do – don’t plan routes that are over-ambitious.
- Be current with flying on instruments; and know how to use any nav-aids that might be fitted to the aircraft. Both these skills could come in handy if you ever become disorientated by accidentally flying into cloud or become temporarily lost.



Preparation

- Discuss your proposed cross-country with a more experienced pilot, or an instructor, to get a second opinion on its suitability for your experience level.
- Select a clear night for your flight – especially if you are planning a cross-country. Anticyclonic winter weather often provides the best night VFR conditions.
- Obtain up-to-date enroute and destination weather information. Always err on the conservative side when interpreting forecasts that might indicate marginal conditions.

“I did not notice entering IMC at first...”

- Be aware of the temperature, dew point, and wind speed as they can often give a good indication of the likelihood of fog forming – there is almost nothing worse than returning to your home aerodrome to find a local fog has rolled in – always nominate an alternate aerodrome.
- Have the correct aircraft instrumentation and lighting systems for night operations, and make sure that they are functioning properly. Always have a torch in case of a cockpit lighting failure – hanging it on a cord around your neck will ensure that you will be able to locate it in the event of an emergency.
- Always carry plenty of fuel. Conditions can change at night, eg a lowering of the cloudbase or fog forming at your home aerodrome, necessitating a flight to an alternate aerodrome.
- Allow sufficient time for your eyes to adapt to the night time conditions, and avoid bright lights while flight-planning inside and again while pre-flying the aircraft outside. Do not operate your strobe lights while on the ground (they can destroy night vision), and avoid looking at other aircraft’s taxi or landing lights while manoeuvring on the ground.

Continued over...

Navigation

- If planning a night cross-country, determine the highest terrain points within a five mile distance either side of your proposed track and mark them on your map prior to the flight. Add an additional 1000 feet on to the highest point contained within this area (caution airspace requirements and the effect of altitude on night vision) – this now becomes your minimum safety altitude (MSA) for the flight. This will mean that if you drift slightly off track, this 1000 foot buffer will provide an adequate safety zone. Remember that you will often have little way of determining how the forecast (or un-forecast) wind is really affecting you as you may not be able to get an accurate position fix relative to your planned track. Also, determine what the highest terrain point is within a considerable distance of your track, add 1000 feet, and this then becomes your emergency safety altitude (an altitude that you can climb to in the knowledge that you will be clear of terrain if you become hopelessly lost).
- Have a predetermined safety heading worked out that takes you towards lower ground, so that if you do become uncertain of just where you are, you can assume that heading to ensure your safety while you seek help from a radar controller. Note that you may require more than one safety heading depending on the location of high terrain along your proposed route.

“Setting your own night VFR minimums is important.”

- Accurate navigation must be achieved using a combination of dead reckoning, township lights, silhouettes of the surrounding landscape, and nav-aids. Always be aware of the possibility that you may be experiencing an optical illusion, or may have developed a mind-set, as to what you are actually seeing – illusions can cause you to make large navigational errors.
- If you do get lost, then the first thing that you should do is, **admit it**. Ensure your own safety first by commencing a climbing turn towards your emergency safety altitude and heading – then contact the appropriate radar control centre for assistance. Do not hesitate to seek assistance, controllers will only be too happy to provide radar vectors to the nearest lit aerodrome – as long as you are within radar coverage.

Setting Your Minimums

Setting your own night VFR minimums is important. One flight training organisation that we contacted was planning to introduce the following night VFR cross-country rules as part of their club policy:

- Each pilot is to be individually assessed and receive a ‘night grading’ by completing a dual night cross-country before they can be authorised for solo operations;
- A competent person is to be present at, or very near (ie able to be contacted by phone), the aerodrome while the flight is being planned;
- The cloud base is to be no less than 5000 feet;
- Maximum possible fuel is to be carried;
- A mobile telephone is to be carried.

You, or your organisation, may wish to consider similar criteria – depending on your local terrain and operating environment.

Summary

Night VFR, especially night cross-country, offers a very rewarding type of flying. The relaxation of the 25nm distance limitation makes substantial night cross-country flights a reality and provides a wide range of new challenges.

In order to operate safely within this new environment, it is important that we treat it with the respect that it deserves. We must make sure that we are current, have had the correct night training, are not over-ambitious about what we want to achieve, and are thoroughly prepared in all respects.

By adhering to many of the night flying techniques that have been mentioned in this article, you should be able to minimise the risks associated with night flying, particularly those related to night cross-country flights. We suggest that you set your **own personal night safety limits** (remembering that the Civil Aviation Rules are only the minimum standard) and try to **stick to them**. If you feel totally satisfied that you are doing everything possible to remain within these limits, then the chances are you’re probably operating safely at night. ■

Cancelled your Flight Plan?

The National Flight Briefing Office in Christchurch and the National Rescue Coordination Centre have both reported a continuation of incidents relating to the termination of flight plans at unattended aerodromes – especially at Ardmore, Paraparaumu, and to a lesser extent Taupo.

Some pilots are entering the MBZ at Ardmore and are forgetting to terminate their flight plan (or SARWATCH) either prior to joining the circuit pattern, or by telephone when on the ground. This is possibly because of the increased pilot workload and unfamiliarity associated with the changes to airspace and procedures for the new MBZ. These pilots have probably been accustomed to having their flight plans terminated automatically by the old Ardmore ATC. A similar scenario is likely for the Paraparaumu incidents.

Whatever the reason, it is extremely important that **you do remember** to terminate your flight plan or SARWATCH to avoid wasting Flight Information Office, Search and Rescue,

police, and aerodrome operator’s time and money. It is also worth bearing in mind that in this era of ‘user pays’ false Search and Rescue callouts may well result in **your** time and money (and conceivably someone else’s life) being wasted.

As mentioned in the previous issue of *Vector*, “Remember to Terminate your Flight Plan” stickers are available from the CAA and Airways Corporation. “Terminate Your Flight Plan/Check Your ELT” keyrings are also available for aircraft owners from the National Rescue Coordination Centre of CAA. These memory joggers are well worth utilising – especially when your brain has half a dozen other things to think about as you are arriving overhead an aerodrome.

Note that when requesting a “Terminate Your Flight Plan/Check Your ELT” keyring from the National Rescue Coordination Centre you should remember to include your aircraft registration details to help keep statistical records up to date.

Aviation Safety Coordinator Courses

Attention Chief Executives!

Four Aviation Safety Coordinator training courses were held in June and July. A further two courses are planned this year. These two day courses will be held in Christchurch on 26-27 November and Auckland on 3-4 December.

An Aviation Safety Coordinator runs the safety programme in an organisation. Does your organisation have a properly administered and active safety programme?

If you are involved in commuter services, general aviation scenic operations, flight training or sport aviation this course is relevant for your organisation.

For further information and enrolment forms contact: Rose Wood, Publications Assistant, Civil Aviation Authority, PO Box 31-441, Lower Hutt, e-mail: woodr@caa.govt.nz

What Is an Aviation Safety Programme?

An aviation safety programme is a formalised and documented plan which focuses on creating safety awareness and reducing accidents. It achieves this through two primary functions, risk management and safety awareness.

The safety programme includes all activities carried out within an organisation in order to maintain and promote safe practices. Such activities will usually include a hazard identification system, an occurrence reporting system, and safety surveys. Awareness will be raised by seminars, videos, magazines, meetings, posters, etc. A good safety programme will stimulate good communication.

A safety programme is a very important part of sound professional work practices. Safety should be very much a part of all aspects of your organisation's activities.

A Safety Coordinator can advise and make recommendations – the authority and instructions for implementation must come from a management level. The success or failure of any aviation safety programme rests at that level.

The first step must be commitment by the top management to a safety programme.

Formal training of your Aviation Safety Coordinator can be provided by the CAA.

Why Have a Safety Programme?

The short answer is, "If you think safety is expensive, try having an accident!"

You may be insured for direct costs, but the indirect costs of an accident are many times greater (latest figures suggest 4:1). A safe operation could be critical to staying in business.

The benefits are many and include a safer operating environment for employees and passengers, a more cost-efficient operation, and a positive image leading to public confidence and business opportunities.



New Video

We have just released a new CAA Aviation Safety Video entitled *The Final Filter*. This 16 minute video looks at the role that the 'human factor' plays in the everyday decisions that we make as pilots in the general aviation environment.

The GA pilot often has to face a mountain of complex information and variables that can require both experience and sound training in order to arrive at a safe outcome. We can find ourselves not only having to fly the aircraft, but also having to make vital decisions as the surrounding conditions change.

This video is relevant to all pilots as part of 'Aviation Human Factors' training. It not only looks at how we

can better understand and evaluate our performance as safe pilots, but also presents a number of scenarios that help illustrate how that performance can be influenced. We are ultimately 'the final filter' in the decision making process. Understanding how to evaluate our performance in different situations can allow us to break the chain of events that can lead to an accident.

With the release of *The Final Filter*, our 1989 production *The Human Factor* is now withdrawn. *Decisions, Decisions* produced in 1996 also deals with human factors and decision making and is complementary to this latest title.

These videos can be borrowed from the CAA Library. A list of all videos available, and information on how to borrow or buy them, was included in 1998, Issue 4 of *Vector*.

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Note that Owen Walker now has a separate fax number.

How To – Fill the GAP

How to be a Pilot, the new booklet in the *How to* series from the CAA, is now available.

This series aims to help interested people navigate their way through the aviation system to reach their goals. *How to be a Pilot* outlines pilot licence requirements, the training required and approximate costs, and aims to encourage aviation as a possible career, sport or hobby.

How to be a Pilot is now available from your local high school, aero club or training school.

GAP (Good Aviation Practice) booklets are also now available on the following subjects:

Winter Operations
Bird Hazards
Wake Turbulence
Weight and Balance



GAPs aim to provide the best safety advice possible to pilots and are available from most aero clubs, training schools or from Field Safety Advisers (FSA contact details are usually printed in each issue of *Vector*). Bulk orders can be obtained from:

The Safety Education and Publishing Unit
Civil Aviation Authority
PO Box 31441, Lower Hutt
Phone 0-4-560 9400



Letters to the Editor

Single or Double?

The recent article in *Vector* about lifejackets implied that TSO C13 compliant jackets are exclusively double chamber. TSO C13 jackets may in fact be either double- or single-chamber.

Frank Grant
Tech Services Systems Support Engineer
Air New Zealand
August 1998

Well spotted! And thank you for contacting us so that we could pass on the correct information. *Vector* apologises for the original error.

Pilot Rating Quiz Follow-Up

We have had a few queries relating to the answers provided to the Pilot Rating Quiz that ran in the last issue of *Vector*. Some readers were surprised to read that you needed to complete three solo takeoffs and landings in order to hold a valid type rating.

The last paragraph of the Pilot Rating Quiz answers (p7) stated that "... you must complete three solo takeoffs and landings to get a type rating, to keep your type rating current, or to get your type rating back". This sentence could be misinterpreted.

Our statement, however, was prefaced with "in both the instances given above". The point that we were trying to convey was that; in order **to carry passengers** you must complete three solo takeoffs and landings to exercise the **full privileges** of your type rating.

It is possible, although not common, that you simply don't want to take any passengers (or you wish to fly a single-seat aircraft) – in which case the three solo takeoffs and landings **do not** apply.

So yes, you can get an aircraft type rating without doing the three solo takeoffs and landings – but the rating will be of **no use** to you when it comes to carrying passengers.

Once you hold a type rating you can never lose it, but you **will** lose the ability to carry passengers if you don't do three takeoffs and landings within the 90-day recency period. Depending on how long it is since you last flew the aircraft type concerned, the duty instructor or aircraft owner may require a dual check before completion of the required takeoffs and landings.

Didn't prepare
Exhausted fuel
Aerobatics too low
Takeoff run too short
Hit high ground
Weight/balance out of limits
Ignored weather
Stall/spin
Hit other aircraft

These are the cause of most Fatal Accidents!

Source; FAA Aviation News August 1998

Publications

0800 800 359 — **Publishing Solutions**, for *CA Rules and ACs, Part 39 Airworthiness Directives, CAA (saleable) Forms, and CAA Logbooks*. Limited stocks of still-current *AIC-AIRs, and AIC-GENs* are also available. Also, paid subscriptions to *Vector* and *Civil Aircraft Register*.

CAA Web Site, <http://www.caa.govt.nz> for *CA Rules, ACs and Airworthiness Directives*.
0800 500 045 — **Aviation Publishing**, for *AIP documents, including Planning Manual, IFG, VFG, SPFG, VTCs, and other maps and charts*.

Accident Notification

24-hour 7-day toll-free telephone

0800 656 454

CAA Act requires notification
"as soon as practicable".