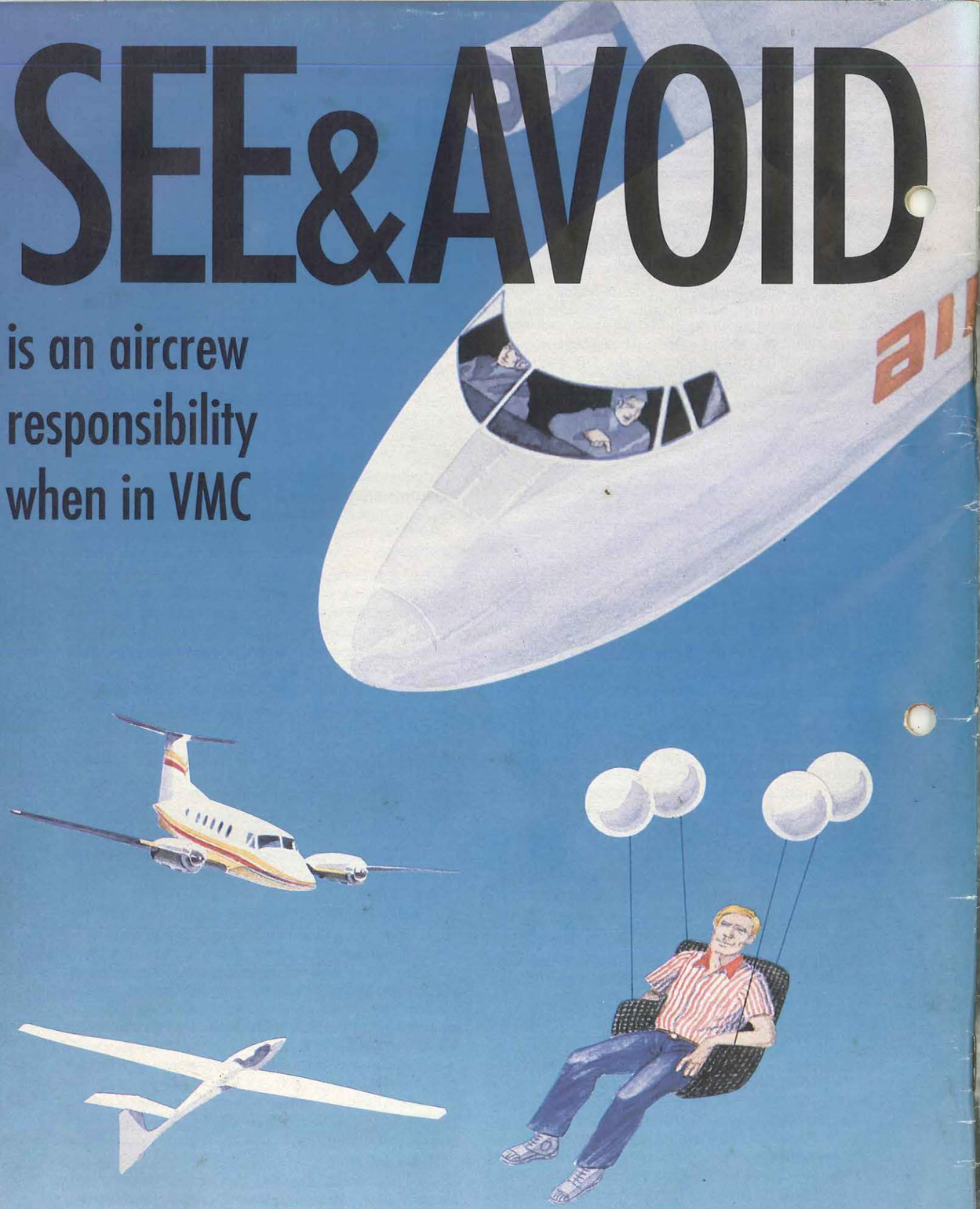
SEE&AVOID

is an aircrew
responsibility
when in VMC



Remember, whether IFR or VFR, when you can see outside – look outside

KEEP THAT SCAN GOING!

Note: Even when in controlled airspace and in a radar environment, all potential collision risks may not be known to the controller.

Civil Aviation Authority
AUSTRALIA

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Aviation Safety Digest

Civil Aviation Authority
AUSTRALIA

ASD 147 SUMMER 1990

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Unless otherwise noted, articles in this publication are based on Australian accidents, incidents or statistics.

Reader comments and contributions are welcome but the editor reserves the right to publish only those items which are assessed as being constructive towards flight safety and will make editorial changes to submissions in order to improve the material without altering the author's intended meaning.

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Contents

Editorial

Personal standards, airworthiness, airmanship, confidence — good marks here mean safe aviation.

Personal standards — Do some of us really feel happy at accepting minimum standards? More important, perhaps, what do the rest of us think of others who may be sharing the same intimate airspace and at the same time re-learning to fly? '89rs' suggests that all too often this may be the case and we could be flying adjacent to a pilot who is always a minute or so behind the aircraft.

Airworthiness — Corrosion can not only streamline your bank balance if you're an aircraft owner, but if you're the pilot as well it could comprehensively spoil your day. Therefore, have another look at the woodpecker nestholes in the old tree on the front cover, read the article inside, then go and check your aircraft. Hopefully there will be no correlation.

Airmanship — a sub-set of personal standards: 'risk-management' if you like. Certainly 'Heavy Landings' is a graphic description of the sort of chain of events that might lead to sleepless nights . . . or a smoking hole in the ground. If you even only 'think' there's something amiss, please be an adult and make it known. Which leads us nicely to:

Confidence — CAIR (are they really confidential?), requests for assistance (surely the world will know!) — both forms of communication must be encouraged if aviation safety is to flourish. I talked about CAIR in ASD 145; here, our Group General Manager is at pains to reassure pilots that confidentiality in these matters is really absolute; if you get yourself into trouble (not, of course, by deliberately flouting the rules) the CAA may subsequently feel moved to offer advice and direct you to appropriate training, but it will not, repeat not, indulge in a dobbing-in exercise.

Covers

Front: 'From wing main spar — Cessna 185B'
Photograph: CAA Materials Laboratory

Back: 'See and Avoid' by The Artworks

Editor:		*Roger Marchant*
Sub-Editor:		*Lyn Coutts*
Diagrams:	*P11*	*Kathy Foldszin*
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Cartoons:	*P7*	*Jeff Bolinger*
	P12	*Soussanith Nokham*
Photographs:	*P4*	*Stan Tilley*
	P8	*Richard Sibly*

Classic beauty — classic blunder

Pilot contribution by Stan Tilley

OIL CAP TIGHT; cowl buttons done up; hand lightly on the propeller (No! the engine does not need pulling through — it's already flown today) CLICK — ROAR!! the engine bursts into life, the plane jumps the handbrake and careers across the aerodrome. As it moves I frantically dodge the scything propeller and leap for the cockpit. No good! I'm knocked flat as the plane drives over me, bounces off a fuel bowser and continues on through the boundary fence.

Damage? Considerable to the wings and undercarriage, not to mention the fuel pump, five stitches in my hand and massive bruising that made it difficult for me to walk even three weeks later.

But, as you might guess, the deepest laceration was to my confidence and self-esteem. How could I, with over 20 years' and three thousand hours' experience, make such a Bloody Stupid Mistake, smash my super little aeroplane and go desperately close to writing myself off in the process?

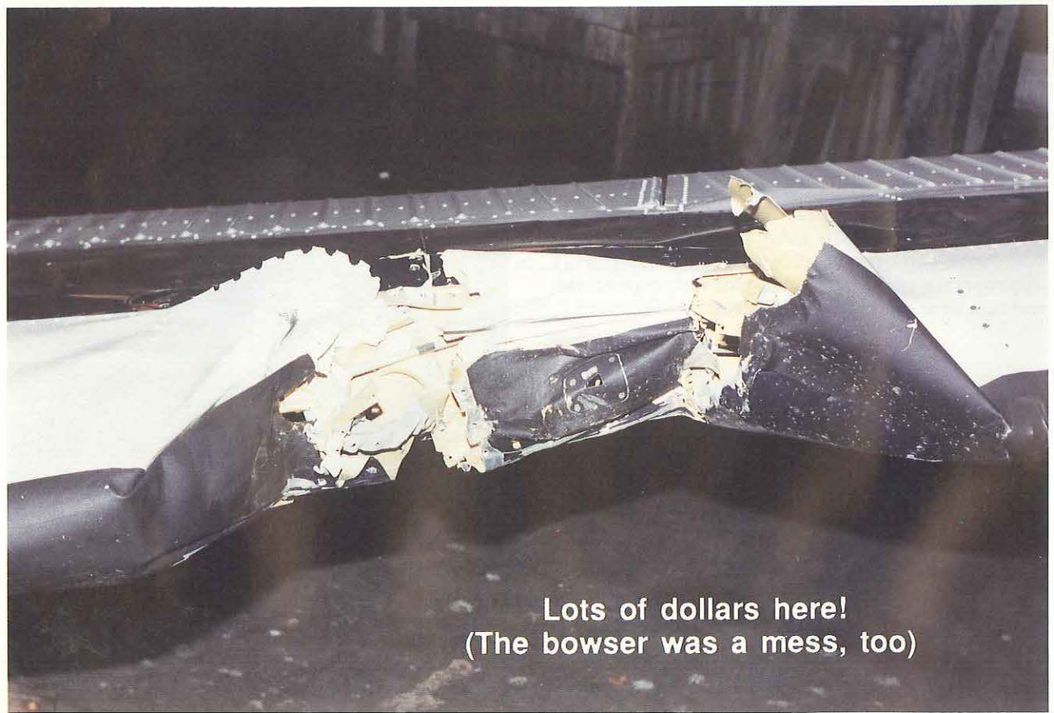
Bad Luck? — No way! If luck had anything to do with it, it was good luck that no other people or aircraft were involved, and amazingly good luck that the fuel installation did not explode.

So why or how did it happen?

The accident occurred around half an hour before last light. Very early that morning another pilot had flown the aeroplane, then about 10.30 I had taken it out of the hangar once more to wash it down and complete a 'daily' in readiness for a planned trip to a destination about 100 miles away, where we were due to stay for a few days.

I had also arranged for a car to be driven to the same place for local use once I had arrived, so I interrupted the daily to deliver the car to my driver, since it was twice the time by road. However, it all came to naught as the driver went sick. So, no panic, the whole thing was put off for 24 hours, allowing me to put some valuable work time in.

I finished late in the afternoon and returned to the 'drome to hangar my aeroplane for the night. Needless to say, it was a magnificent evening and the temptation for a last-minute local flight was just too great. A quick 'walk-round', fuel dip (I hadn't refuelled previously), climb in, buckle up, commence prime for cold fuel injection start — throttle open — mixture rich . . . *hold on, I had decided earlier that some oil was necessary — had I replaced the oil cap correctly and closed the cowl?* . . .Unbuckle, climb out, check oil cap tight, cowl done up, hand 'lightly' [lightly? — ed] on the prop — CLICK — ROAR!!



Lots of dollars here!
(The bowser was a mess, too)

Hindsight:

Perhaps the most frightening thing about this whole disastrous incident was the number of pilots who admitted the same thing had happened to them. Certainly in the majority of cases the results were not serious — sometimes almost funny (the Partenavia going around in circles with one engine running or the pilot hanging on to the tail of the Decathlon come to mind). Others were not so amusing, like the scarred and twisted arm carried by a pilot as a perpetual reminder of his folly.

In every case the common denominator was a hand on a 'live' propeller.

Were these stories true or were my fellow pilots merely trying to make me feel better? I think they were true; in fact, the reports were often prefixed with 'Well, now it's happened to you, I must admit . . .'

So where do we go wrong?

With many of us it was part and parcel of our training to pull the engine through to break the oil seal, check compression and prevent damage caused by a possible hydraulic lock. With the old inverted Gipsy and the smaller radial engines this is certainly still a recommended procedure, but now most modern engines are horizontally opposed. I therefore ask the serious question:

What is more dangerous — to pull a motor through or to risk damage by confining the propeller preflight to a visual inspection only?

I know what I'll be doing from now on!

Any other first-hand experiences? — ed □

Play the percentages!

Pilot contribution

'Nothing puzzles me more than time and space; and yet nothing troubles me less, as I never think about them' (Charles Lamb)

VERY MANY light aircraft pilots list 300 minutes as 'endurance' on their flight plans. But do they really have this?

In an emergency situation, an incorrect figure can have drastic effects. My plane has an endurance of 360 minutes at cruise but I always (used to) insert 300 and calculate fuel purely by time. I rationalised that the extra 60 minutes would be a bonus in hard times and great in an emergency. **WRONG!!** That extra 60 minutes can result in catastrophe. How *can* extra fuel be dangerous?

In an emergency situation, eg becoming lost at night or encountering IMC on a VFR flight, you advise ATS of your predicament. Your endurance is 300 minutes (it's there on your FPL!), and perhaps you have been flying for 240 minutes, say to your destination then half way home; ATC/FS may only be able to advise you of a suitable location to force-land, or vector you to an airstrip that is far from ideal, because as far as they are concerned you don't have enough fuel to go to a suitable alternate aerodrome, perhaps only 30 min away, and still retain the 45 min fixed reserve. Nor are they able to have you climb clear of cloud and/or hold. That extra 60 minutes fuel you've carefully tucked away becomes nothing but a hazard. Whereas it could have saved you and your plane without difficulty, now it may be a sentence rather than a bonus.

So, the only sure thing you know about your endurance is the quantity of fuel on board. Write it down! Fuel flow per hour at cruise should be known, so fuel burned off for the duration of the trip can be calculated. 45 minutes' fixed reserve (at cruise power) is easily worked out. 30 minutes' holding at a capital city? This would not be at cruise but may be down around 45%. Determine the flow rate and insert this. Taxi and run-up? No time, but insert an appropriate fuel quantity. Subtracting the above amounts from your initial fuel load, then dividing the result by the fuel flow at cruise gives you your actual margin. Endurance is then the sum of fuel required and the margin, translated into time.

OK, so this may take a few more minutes on the ground, but the few more minutes you squeeze out of your calculations could save your life in the air!

All that I can add to this is a common-sense reminder: if, for any reason, you calculate that your endurance has changed, tell the Air Traffic Service you are currently working. Armed with up-to-date information, they can offer you the very best option if things go wrong □

'89rs'

pilot submission from Jeff Bolinger

OVER THE YEARS I've learned that practice nudges towards perfection. Not that I've reached such a height; nevertheless, it's nice to know that persistence pays off. On the other hand, little or no practice results in poor performance and this I can relate to.

In the flying business minimum practice qualifies you as a safety hazard teetering on the edge of danger and disaster. Your horoscope probably reads; 'Day Wrecker'. Those of you shaking your heads in protest save your breath. You can kick and scream all day, but the truth is you know when your flying is sloppy. That excuse you call a landing proves that you're way over par for the course. Yes, it's you they're all pointing and laughing at . . .

Being a married man, I tossed away my ego years ago and have no trouble admitting that I have to work hard just to reach a comfortable average. So I'm not a natural-born flyboy, and nor are you unless there's plumage sticking out of your backside and you resemble 'Condor Man'. There's nothing wrong with being average as long as you are at a safe level of proficiency; that means regular practice.

Just like most of you should, I work for a living and have to support my bad habits by a lot of compromise. My recreation has been cut to one half-price movie a week or a Friday night home video marathon with Pizza Hut doing the catering. So when it's time for me to squeeze in a fortnightly flurry of circuits or a condensed airwork routine, the last problem that ATC or any other pilot wants is to be baby-sitting an 89'r.

What's an 89'r you ask? You know who you are. You're the ones who fly once every eighty nine days or so attempting to maintain some kind of currency. If you're that desperate, give me your name and address — I'll do us all a favour and send you fifty bucks to stay away from airports. You aren't pilots, you're accidents about to happen. You wildguns make me nervous; take up sailing — it's cheaper and safer. Or how about all you fairweather IFR 89'rs, you're my favourites. At least I've got enough sense to stay home on a lousy day and do the domestics . . . *right dear?* Generally speaking, pilots are supposed to be an intelligent group of people: I'm convinced otherwise.

To waste thousands of hard-earned dollars on a flying fantasy instead of buying a house, two cars, or a three week holiday in Hawaii is absurd. I don't care how much the nut next to me on the run-up bay loves to fly so long as when our hero is turned loose, he's safe. After all, safety's the issue here.

Now, to raise an issue without offering a solution is kind of like waking a hungry lion with no intention of feeding it. So how about changing biennials to annuals and requiring three take-offs and landings every thirty days instead of ninety days. That'll keep the real pilots in the air (and, more important, the corollary to that assertion). Sure, the 89'rs will become 29'rs or Parker pen pilots — no system is flawless; however, with any luck they'll get tired of it and lose interest. If you're going to fly mate, **FLY**. If not, give it away.

On the way home from the airport this afternoon I was nearly forced off the road by this lunatic driver. As he roared past me I caught a glimpse of his bumper sticker. It read, *I'd rather be flying*. I could only pray that when this idiot bought the car, the sticker was already on it.

Steve Tizzard (E of A, GA) observes:

Sadly, the scenario painted by Jeff is all too often true: most low-time pilots who fly a mere three circuits per ninety days maintain little more than 'theoretical' currency. They may get some form of satisfaction from their legal currency, but in truth they are proficient only in the circuit and in the best of weather. I shudder to contemplate them facing any sort of airborne emergency.

Part 40 of Civil Aviation Orders is a distillation of many years of both national and international regulatory experience. It sets out the minimum exposure to certain operations deemed necessary for a pilot with average skills and knowledge. It goes without saying that this minimum cannot be expected to guarantee a safe performance under all circumstances and it is fortunate that most organisations hiring out aircraft require more evidence of competency than could be offered by an 89'r before they let someone take charge of an expensive piece of equipment.

As a former full-time GA instructor I sympathise with the suggestion that 89'rs become 29'rs and that BFRs become YFRs. However, although accident statistics do not support this point, performance figures might well indicate that modern lighties are relatively forgiving contraptions, and many 'pilots' kid only themselves as to their personal flying competence.

For persistent 89'rs I suggest the answer is not with Big Brother and more regulation (refer our Chairman), but in your own hands. That hard-earned money will be better spent in regaining currency via a good session of circuits (normal, glide, flapless, STOL), all in a decent crosswind and with an instructor. You will be amply rewarded by the discovery that your skills leave a lot to be desired □

Heavy landings

(extracted from a pilot report)

THE INCIDENT appearing on page 13 of *ASD 142*, concerning unreported damage to the left undercarriage of a PA28, reminds me of an almost identical incident.

It was a NVFR flight under the supervision of an experienced flying instructor, for the purpose of regaining currency after about 12 months since last I flew at night. The trip was to include a series of touch and go landings.

The first landing was heavy due to a misjudged flare, caused in part by my being distracted by the late departure from the runway of a preceding aircraft. The flare was such that the flying instructor apparently did not contemplate assuming control, and the landing aroused comment from neither him nor an experienced back seat passenger. To my surprise, the aircraft did not bounce after touchdown. Nothing was said about the severity of the landing; all on board considered it to be within reasonable limits.

Certainly, I have at various times observed other pilots make apparently harder landings, both in this and other aircraft. During the debrief the instructor made no comment on the landing; indeed, several days later, when questioned about the flight, she could remember nothing that might have damaged the undercarriage, and was 'flabbergasted to think that any damage might have been done on that particular flight'.

However, to return to the flight in question, immediately following the landing an undercarriage problem occurred in that the gear 'in transit' light remained illuminated. As the micro-switches were a known problem, this was not a cause of immediate concern. Then the load meter showed that the electro-hydraulic pump was not operating continuously, and recycling the gear plus a further landing did not resolve the problem. The trip was cut short and a 'normal' final landing made.

The problem with the 'in transit' light was reported to the owner on the following morning, and that afternoon the aircraft was positioned in preparation for a travel flight, which was completed the next day. The pilot apparently found no damage on either pre-flight inspection, and on arrival at his destination approached a LAME to fix the 'in transit' problem; this was immediately diagnosed as being the result of damage to the left u/c assembly. The LAME considered it so severe that the wing could have collapsed under stresses imposed by merely taxiing the aircraft. Both top and bottom wing skins were fractured and considerable internal damage was found.

The damage was reported to the owner [*and written up? — ed*], who contacted the several pilots who had recently flown the aircraft. No-one (including me) admitted a heavy landing. In my case, I was backed up by the instructor with whom I flew the night circuits.

On reflection, though, it is likely that the major damage was caused by my landing, which I still believe to have been within normal limits. My hypothesis is that there may be either a structural or design weakness in certain types of light aircraft that allows a progressive failure to occur in the area of the u/c attach point in the wing. The occurrence which finally causes the damage may not be of the magnitude required to alert the occupants to the fact that the damage had occurred. I feel that it is likely that the u/c failure, apparently resulting from my 'heavy' landing was the result of a progressive failure over a period of time and needs to be addressed by periodic maintenance. I believe that during repair it was noticed that several rivets in key areas had failed at some point prior to the main failure.

I asked a colleague, who heads the structures cell in Airworthiness Branch, to comment here. He assured me that a search of Major Defects Reports revealed no evidence of progressive failure of the PA28R landing gear, or indeed, that it does not meet design requirements. When defects are found, they are attributable to defective maintenance or actual abuse. Perhaps pilots of light aircraft expect too much of the undercarriage?

What an aircraft designer can and does do is to build in systems, warnings and check requirements that are intended to bring to light incipient or actual problems. But, just as any beast of burden, an aircraft will show unequivocally that it is being overstressed or maltreated — BUT ONLY TO THOSE WHO LOOK WITH DILIGENCE. As to the heavy landing(s), with a consequential dismissal of ominous signs and/or non-recognition of actual damage, well, a warning is a warning is a warning — and if you get three before you become part of a smoking heap you're luckier than you deserve to be... □

Free! Free! Free!

Nearly !

NOTAM C4 / 1990

refers to a fax trial within Sydney and Brisbane FIRs to offer pictorial information on Military Low Jet Route (LJR) operations. Low flyers are strongly encouraged to phone details to 008 / 028238 (RAAF Amberley QLD) or 008 / 077243 (RAAF Williamtown, NSW) to allow F18 and F111 crews to plan accordingly. PLEASE advise your local RAPAC of the effectiveness of the trial.

Search and Rescue — Alerting

Jim Hanigan, National SAR School

OVER THE HISTORY of aviation, methods of alerting the Search and Rescue (SAR) system have been developed according to the technology available. Initially, people only reacted to the non-arrival of a particular flight when there had been some form of pre-take off warning. As the 'electronics' industry grew, pilots became able to advise ground operators of in-flight emergencies and diversions.

By the early 1970s, both electronic and battery technology had advanced to the stage where a low-power transmitter carried in an aircraft was capable of being automatically activated in the event of an crash. Thus the Electronic Locator Beacon (ELB) became a part of the safety-conscious aviator's essential items of equipment. The system not only aids the aviator in distress but also the mariner, who uses a similar beacon called an Electronic Position Indicating Radio Beacon (EPIRB).

In the earlier years of the ELB, success of the alerting function of this equipment relied on the monitoring capability of aircraft flying through the area. Nowadays, though, the big eyes in the sky forming COSPAS/SARSAT are becoming increasingly efficient in receiving and reporting (with position information) emergency transmissions.

An International cooperation program involving Canada, France, Great Britain, Norway, the Soviet Union and the United States of America developed the COSPAS/SARSAT system. COSPAS is an acronym in Russian meaning Space Project for Searching for Vessels and Aircraft in Distress, while SARSAT stands for Search and Rescue Satellite Aided Tracking System. The system does not have its own dedicated satellites but operates from packages carried by other agencies, such as the weather satellites operated by NOAA, in near polar orbits.

The system can operate by detection of the signal radiating from existing ELBs and EPIRBs on 121.5 MHz. As the satellite passes the position of the beacon, an apparent shift in frequency (Doppler Shift) is detected and analysed by ground-based software. This analysis will provide a latitude and longitude readout of the beacon location. On the initial pass, an ambiguity will result because of a second possible location of the beacon, the mirror image on the other side of the satellite's track. Second or subsequent satellite passes will resolve the ambiguity and isolate the transmitter. A typical error in position for a current generation ELB is of the order of 20 km radius.

One of the greatest limitations of COSPAS/SARSAT operation with 121.5/243 MHz beacons is the requirement for the satellite to be visible simultaneously to both the beacon and the ground station, as this part of the system operates in a relay mode. The area thus covered, however, handsomely contains Australia's domestic airspace. A second major limitation is that the system can become saturated when too many beacons transmit simultaneously.

A new generation beacon has been designed to operate with COSPAS/SARSAT on 406 MHz. Rather than transmitting the distinctive warbling tone of older 121.5/243 MHz units, this new beacon will emit short coded bursts every 50 seconds. Several benefits will result, including:

- Coding will provide specific beacon (and therefore craft) identification.
- Improved area coverage: these signals can be stored on board the satellite when no ground station is visible, then downloaded when the next station comes into view.
- Greater accuracy in position, typically of the order of 3 km, because of closer tolerances in beacon specifications.

Australia has an earth terminal called a Local User Terminal (LUT) to receive COSPAS/SARSAT information. The terminal is located at Alice Springs, with the Mission Control Centre at the Marine Rescue Coordination Centre Australia (formerly Federal Sea Safety Centre) in Canberra. This centralised location can view the satellites anywhere within the Australian continent and, as they 'rise' and until they 'set', for some distance offshore. However, information from up to double that distance is attainable, as each satellite has its own horizon and thus can receive then relay emergency transmissions from as far east as New Zealand or New Guinea in the north.

As the new beacon uses pulse transmissions, direction finding systems on search aircraft will not be effective. Consequently, a second transmitter operating on 121.5 will have to be included with the package to enable final homing on to the target. However, this secondary beacon can be of a lower power than present ELBs, giving an extended battery life and reducing the saturation level of COSPAS/SARSAT.

Reliability of Beacons

Currently, the ELB is the weakest link in the SAR alerting system. Certainly a beacon could be designed to withstand the extreme forces applied during an aircraft crash, including the possible post-impact fire. However, the cost of this equipment would be extremely high. Statistics available from Canada and the USA indicate that current generation beacons have failed to activate on two out of every three accidents. A Canadian analysis of 155 accidents over a five year period has classified some of the reasons for failure as follows:

- 30% — human, not armed or not carried (although carriage was indicated on flight plan or flight was in an area where carriage was required).
- 17% — environmental (ie antenna under water).
- 50% — malfunction due to crash.

Added to the above poor reliability is the high number of false alarms generated by current ELBs. No attempt has been made to extract data for the Australian scene (although this will be done eventually) but again using overseas statistics, a false alarm rate of the order of 97% is indicated. Such poor statistics do not encourage the aviator to invest his hard-earned dollar in a piece of equipment that has a low chance of performing when required, yet a high probability of embarrassment due to inadvertent activation.

Similar statistics can be expected for the Australian area and will be presented when available. The disturbing factor in the analysis is the number of pilots who are prepared, whether knowing its shortcomings or not, to fly without the safety device fitted or with the device fitted but not armed, possibly in the belief that 'It can't happen to me'!

A number of measures can be taken to reduce the incidence and/or duration of false alarms.

- 'Start up' and 'shut down' procedures in AIP and VFG include a suggested technique for pilot monitoring of 121.5 and the reporting procedures that should be followed if an inadvertent activation is discovered.
- Pilots should know when ELB equipment is fitted to the aircraft being flown; if a 'hard landing' is experienced, check 121.5 MHz to see if the beacon has been activated — if it is transmitting, switch it off immediately and inform your nearest Air Traffic Services Unit.
- Include a physical check of the ELB during your pre-flight checks if possible. This could also include a regular periodic check of operation on the 'Test' function in the prescribed manner.
- Remove batteries from a portable ELB when it is not intended for use for some time (say one week or more).

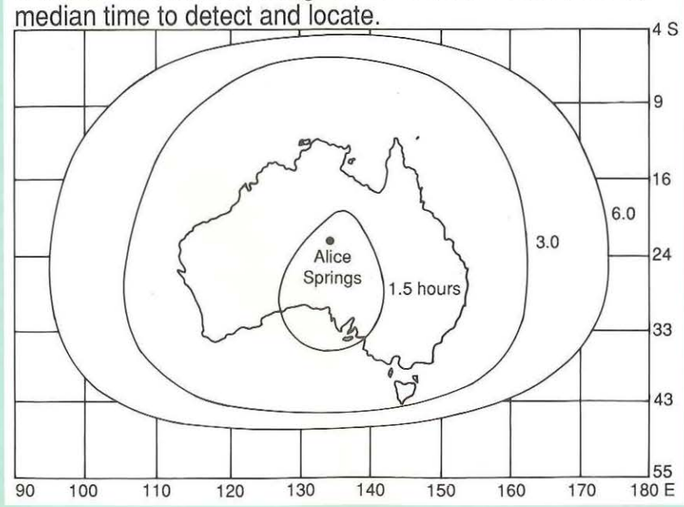
SUMMARY

Some of the statistics shown above do not convey a favourable impression of the ELB as an alerting device. *However, this equipment is essentially first generation and the technology is advancing rapidly.*

Remember that these small emergency transmitters can save the lives of those unfortunate enough to be involved in an aircraft accident. Australia has its own LUT for COSPAS/SARSAT. This will provide the location of an ELB within 3 hours of activation, significantly reduce search time and, as a direct consequence, increase prospects of survival.

In the centre section of this edition is a small questionnaire that we ask your indulgence in completing and returning to the address shown □

COSPAS/SARSAT coverage for 121.5/243 MHz EPIRBs; median time to detect and locate.



A little learning is a (very) dangerous thing

Pilot contribution by R A Perkins

I AM WRITING to you regarding the recent fatal accident in Sydney involving a student pilot during solo flight training.

It appears from the pictures on TV that the aircraft impacted the ground nose-down at high speed with partial flap extension, and it was reported that the student was practising stalls. It appeared that the aircraft was not recovered from a fully-induced stall and was possibly in a spin.

When I was doing solo flight training I always dreaded stalls, as all the time in the back of my mind was the question *can I recover from a spin should it ever occur?*

Sure, we were always shown how to recover from a stall, and if an error was made with the instructor present the necessary corrections were made before anything dramatic developed.

Looking back through my training syllabus, spins and spirals were only covered as the second last exercise. On reflection, I believe it would have been more useful to have covered spin recovery much earlier — as early, in fact, as the introduction to stalls before circuit training. I believe that a student pilot should experience recovery to level flight from every possible attitude of the aircraft, in order to become accustomed to the aircraft's handling and to gain confidence in one's own ability to react instinctively should the need arise.

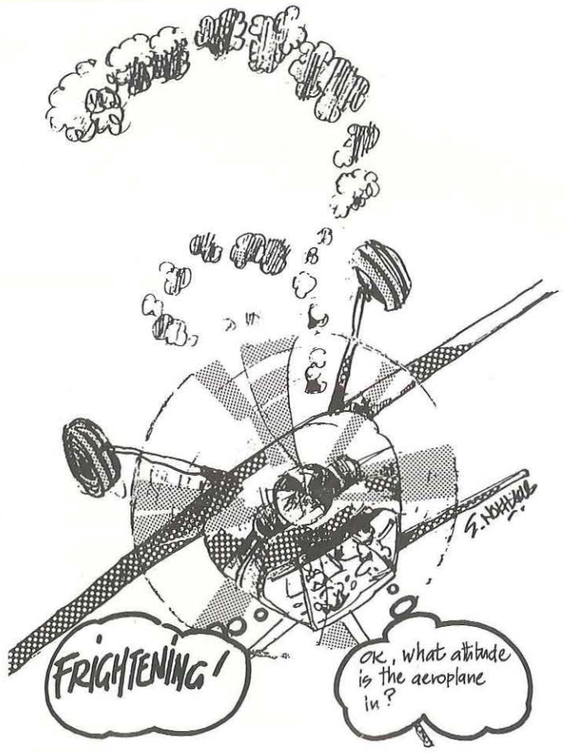
To this day I still approach stalls with less than 100% confidence, so I think it's time for me to do more than a bit of soul-searching — thinking that the accident could have been me and doing something about it:

(a) writing to you to start a discussion on the subject;

(b) suggesting that flight instruction centres put more effort into teaching spin recovery- everyone can fly straight and level; and

(c) enrolling myself for a course of aerobatics to gain confidence in handling the aircraft in all attitudes.

As a footnote, I should like to record my thanks to my RPPL examiner for putting me through a few different manoeuvres and recoveries that previously I had not experienced.



We admire the courage of this correspondent for freely admitting his lack of confidence in his ability to recover the aircraft he is flying from any unusual attitude. His problem is reasonably common and is a shocking indictment of some so-called professional flying instructors.

We feel so strongly about the predicament this pilot finds himself in that an entire edition of this magazine could be devoted to answering his concerns and those of many others like him. These problems stem from flying training often being little better than the blind leading the blind. For a variety of reasons the flight instructor profession is unique in that the bulk of the teaching appears to be given by those who are themselves very much at the bottom of the learning curve. Hence we have people poling around the sky who, just as the pilot in question, are unsure of their ability to control the aircraft in other than normal circumstances.

We believe this situation is so serious that, as requested, we will initiate thought and discussion on the topic of unusual attitude recoveries in general. Therefore, in place of our normal quiz, we sincerely solicit your considered response to the questions in the centre section. An analysis of the results will be published in a near-future Digest □

AIRFLOW

Feeling a little query?

The AIRFLOW column is intended to promote discussion on topics relating to aviation safety. Input from student pilots and flying instructors is particularly welcome.

Anonymity will be respected if requested. 'Immunity' applies with respect to any self-confessed infringements that are highlighted for the benefit of others.

Write to: AIRFLOW
Aviation Safety Digest
G.P.O. Box 367
CANBERRA A.C.T. 2601
Australia

Nikon

Entry Form for the Aviation Safety Digest Photographic Competition

Dear Sir,

Enclosed is an entry for the Aviation Safety Digest Photographic Competition. Details are as follows:

Category of Entry: _____ *Film Size and Type:* _____

Camera Type: _____ *Caption or Title:* _____

Description of the Photograph and Theme (please identify any aircraft type): _____

_____

_____

Name of Entrant: _____

Address: _____

Phone and/or Fax no. _____

I agree to be bound by the conditions of entry as described in the advertisement

Signature: _____ *Date:* _____

TO: *Photographic Competition*
Aviation Safety Digest
Civil Aviation Authority
GPO Box 367
Canberra ACT 2601

ENTRIES CLOSE: *Last Mail*
Friday, 4 April 1991
Results will be published in the Spring edition of the Digest

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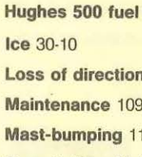
Emergencies

Flying techniques

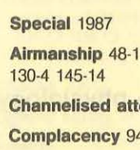


Gliding

Helicopter

Human factors — physiology

Human factors – physchology



Inflight operations

Instruments and navaids

Maintenance and servicing

Meteorology

Mustering

Night VMC

Parachuting

Preflight preparation

Special operations

Training

Ultralights

Privacy or Paranoia?

In ASD 146 was to be found a letter from Alan Heggen, Group General Manager, Safety Regulation. In it Mr Heggen asked that pilots seek assistance whenever they found themselves in need, rather than battling on in self-imposed silence.

The letter elicited lively response, typical being the sentiments expressed by an up-and-coming pilot. His letter follows, together with Mr Heggen's reply. Airlines particularly, and employers of pilots generally, are asked to write to us and make their position in this matter quite plain:

Dear Sir,

I have just received your open letter to all pilots regarding the need for pilots to ask for in-flight assistance should they find themselves in difficult circumstances, and I appreciate the comments you have made in that letter.

However, there is a fear that exists amongst those of us who are involved in obtaining CPL licences with the intention of gaining employment with the major airlines that ANY Form 225 [*now renumbered CA 2593*] with your name and licence number on it constitutes a 'black mark' against your file, regardless of the incident, and that this data is readily accessible and utilised by airline recruiting sections to determine an applicant's suitability.

This is not isolated 'crewroom chatter'. I have spoken with pilots from many schools throughout Australia and on the CPL subject courses I have attended, and the prevailing mentality is that any requests for assistance from ATC due flight difficulty, or any other incident resulting in a 225 being filed, can have long-term effects on your career. This is a major reason why many pilots avoid reporting problems.

If safety is at stake, there is a need to utilise every available means of assistance, both within the cockpit and from external sources, but pilots who intend to be career pilots will continue to weigh up the two issues - on one hand 'I'm stressed out and in trouble - I need assistance', and on the other 'Is it worth my while to report I'm in trouble?'

For what it's worth, I hope this gives you a bit of an idea of what's going through the minds of many CPL candidates, especially as things become more competitive and expensive, and airlines have more people to choose from. I would appreciate any comments you have on this issue.

Yours faithfully,

Craig Smith

The Group General Manager Replies

Dear Mr Smith,

I was very gratified to receive your letter of 2 October 1990 but was somewhat dismayed to read of the apprehension that you say exists in the minds of CPL candidates regarding the flow-on effect of a call for assistance.I can understand that such concerns might exist, and it would be naive of anyone to deny the existence of the 'bush telegraph'. However, I want to assure you and the entire aviation community that you are quite incorrect in your belief that an individual's aviation history record is readily accessible by airline recruiting sections, or indeed by anyone outside the Bureau of Air Safety Investigation and the Civil Aviation Authority.

Protection of information relating to an individual's aviation history is not simply a courtesy extended by BASI and ourselves, it is a privilege conferred by law. The Privacy Act 1988 makes provision for protection of privacy of individuals and it places very specific constraints upon 'record keepers'. In brief, the Act prevents the 'record keeper' (in this case BASI or the CAA) from using or disclosing personal information except with the consent of the individual concerned or when it is necessary, for instance, to prevent serious or imminent threat to the life or health of persons, or for the purpose of enforcing the law.

The contents of an individual's aviation history file are therefore most definitely not accessible to a potential employer. CAA officers are not only extremely conscious of the law governing protection of personal information, but they are responsible people who respect the rights of the individual.

I suggest also that you misjudge the perceptiveness of potential employers. I am certain that in most cases applicants would be required to provide a résumé of their aviation history, including any involvement in incidents or accidents. I find it difficult to believe that any employer worth his salt would look unfavourably upon pilots who had had the good sense to call for assistance when finding themselves in need of it. In fact, I expect that an airline would derive a certain amount of satisfaction from knowing that its applicant was prepared to place the safety of the aircraft and its contents above personal (false) pride.

I trust this letter will serve to allay any concerns that you and your associates may harbour. Nevertheless, I would be interested to know whether I have judged the employers' position correctly or otherwise and, as I discussed with you, I will be seeking their comment through the *Aviation Safety Digest*

Yours sincerely,

Alan Heggen

CHANGES TO VFR OPERATIONS IN CONTROLLED AIRSPACE

In keeping with the CAA objective of more people benefiting from safe aviation, the way in which Air Traffic Control apply separation to Visual Flight Rules aircraft operating up to and including 10 000ft is about to change.

The effect of this change will be to speed the flow of these flights in controlled airspace.

Under present procedures, separation between VFR aircraft (below 5 700 kgs MTOW) operating in Primary Control Zones may be achieved by requesting the pilot of one aircraft to sight and follow another aircraft, provided the pilot acknowledges acceptance of this responsibility and advises ATC how the separation will be achieved - a somewhat cumbersome process, but one which was developed having regard to legal precedent regarding the functions of ATC.

Aircraft operating to Visual Flight Rules (VFR) in Control Areas in Australia are at present provided with the same positive air traffic control separation service as aircraft operating to Instrument Flight Rules.

Regulation changes, which are expected to become effective in January 1991, will enable ATC to allow the pilots of VFR aircraft to provide their own separation from other VFR aircraft.

What are the implications for VFR pilots?

As from the date the legislation is changed, in Primary Control Zones and their associated Control Area steps, up to and including 10 000ft, ATC may achieve separation by:

- instructing the pilot of one aircraft to "sight and follow" another, or
- by providing traffic information on other VFR aircraft.

The traffic information will contain any of the following data as necessary to assist the pilot in identifying the other aircraft:

- type
- callsign
- altitude
- position, either by o'clock reference, bearing and distance, relation to a geographical point or reported position and estimate intentions
- direction of flight.

The pilot's responsibility will be to operate according to the terms of his ATC Clearance and maintain constant surveillance in order to provide safe separation. However, if a pilot, having been given traffic on another aircraft, is unable to provide safe separation, e.g he is unable to see the other aircraft or is not sure of the other aircraft's intentions, he will be able to request ATC to provide the separation by use of the phrase, 'REQUEST SEPARATION FROM ..... (callsign of the aircraft if necessary)'.

Of course, if a controller observes aircraft to be in close proximity and on converging courses, he will ascertain whether one pilot has the other in sight or will issue instructions to one or both aircraft to resolve the conflict.

What *can* they be doing / *thinking / saying?*

To celebrate 1991, we thought we might run a small competition. Just this once, we've been let off the leash, so entries do not have to be aviation safety orientated (although that is not to say that the judges won't look kindly at entries that reflect ASD's mission). The (original) caption adjudged the funniest will earn its writer an (original) Safety Promotion Unit plaque, eminently suitable for hanging where one can sit and gaze at it in quiet and isolated contemplation...

Competition closes 31st March 1991, address as per the inside cover; we'll publish the best printable entries in the Winter edition. Others will be enjoyed in the privacy of the Digest Office.

CAPTION: _____

_____

Name: _____

Address: _____

Search and Rescue Questionnaire

The SAR article on page 10 is the first of a series which is aimed at increasing the level of SAR awareness. Future topics could include SAR Trained Operators, SAR Training, Supply Dropping, and Observer Training. While there are many topics that can be covered, these would only reflect the views of the author. What we would like to hear from you is a list of topics on SAR that can be discussed in ASD.

I would like to suggest the following topics for discussion in future issues of the Aviation Safety Digest:

.....

.....

.....

Apart from the possible interest in reading about it, there may be some readers who wish to do something about SAR through some form of training or learning package. So that the degree of interest can be determined, could you please indicate the type of training course or self-tutoring package you would like to be made available.

.....

.....

NAME _____

ADDRESS (optional) _____

_____

_____

Please return to:
Jim Hanigan, National SAR School
P O Box 367, Canberra ACT 2601

Spin recovery Questionnaire

Please describe the various recovery techniques as follows:

1. ***Incipient stall***
What I was taught:

What I do:

Why there is any difference:

2. ***Stall:***
What I was taught:

What I do:

Why there is any difference:

3. ***Incipient spin:***
What I was taught:

What I do:

Why there is any difference:

4. ***Spiral dive:***
What I was taught:

What I do:

Why there is any difference:

5. ***Unusual attitudes:***
(a) nose low:
What I was taught:

What I do:

Why there is any difference:

(b) nose high:
What I was taught:

What I do:

Why there is any difference:

General comments:

Name and address (optional)
Licences/ratings held:
Total hours:
Contact phone number(working hours):
(optional; it is only to allow resolution of any misunderstanding)

Please send your answers to:
The Editor, Aviation Safety Digest
PO Box 367
CANBERRA 2601.
Thanks very much.

Aviation Safety Awareness Seminars

These seminars are conducted jointly with the CAA and Aircraft Owners and Pilots Association and the 1991 program is as follows:

23 February	Warrnambool
23 March	Canberra
20 April	Sydney
25 May	Melbourne
15 June	Darwin
20 July	Brisbane
24 August	Mackay
28 September	Launceston
26 October	Perth
23 November	Adelaide

Each seminar will be advertised widely prior to the event.

For further information on these seminars please contact either AOPA or the Field Office Safety Promotion Liaison Officer.

Safety Promotion Liaison Officers

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Civil Aviation Authority
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P O Box 2270
ADELAIDE SA 5001
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WA

Bill Birkbeck
Safety Regulation
Civil Avition Authority
GPO Box X2212
PERTH WA 6001
Telephone 09 3236695

AERONAUTICAL INFORMATION SERVICE AUSTRALIA

NOTICE

CURRENT DOCUMENTATION AND PLANNED NEXT ISSUE

Document	Current Issue #	Planned Next Issue #
DAP(E)	13–12–90	7–3–91
DAP(W)	10–1–91	4–4–91
INTERNATIONAL AGA 0 – 1 – 2	31–5–90	30–5–91
AIP (book)	13–12–90	@
VFG (book)	13–12–90	@
AIP/MAP	13–12–90	*
VFG/MAP	13–12–90	*
DAH	13–12–90	*
ERSA	13–12–90	7–3–91

Dates quoted are effective dates

@ AIP and VFG are subject to review and a complete reissue is expected in the first 6 months of 1991

* The next issue of charts will be delayed due to implementation of new airspace management requirements.

NOTE : NOTAM CLASS I AND CLASS II ARE TO BE READ IN CONJUNCTION WITH THE ABOVE DOCUMENTS

ISSUE : 12
DATE : 23 SEPT 1990

Weatherwise flying

Articles prepared by the Bureau of Meteorology in ASDs over the past two years have dealt with many aspects of aviation weather in order to improve pilots' understanding of various phenomena, and thus enhance safety. This short article sets out to provide some overall principles for weatherwise flying, whatever the circumstance the pilot is in.

THE BASIS of all safe flying operations is *pre-flight planning*. It is here that an assessment of the met. forecast becomes most important, and no rational evaluation of the met. officer's work can be made unless the content of the forecast is completely understood. Area forecasts are largely in plain language and aerodrome forecasts, although coded, are not all that difficult to comprehend.

OK, so you understand what the met. officer is trying to tell you. What now? Well, at this stage it is helpful to

- develop a mental picture of the weather and relate it to the terrain. If there are any discontinuities (trough lines, fronts etc), their impact on the desired route must be assessed.
- plan alternative courses of action if marginal conditions are forecast — these important decisions are far better made at the time of initial planning than if left until the pilot actually experiences hazardous weather conditions.

Operations in:

- remote areas;
- the tropical north in the wet season; and
- unfamiliar areas

all require meticulous attention to weatherwise flying. The following two extracts bear this out:

from *ASD 126*

The relevant Area Forecast showed that there was a surface trough situated close to the Birdsville-Alice Springs track. At latitude 25S (lying approximately along the planned track) the wind direction was predicted to change through some 120° at 7 000ft on QNH from one side of the trough to the other.

The pilot had completed his flight plan using the 7 000ft w/v (250/15) for south of 25° south. However, once the aircraft was descended to 3 500ft, it was affected by a markedly different wind (140/15). The flight plan had not taken this into account and therefore the pilot made no appropriate allowance. The altered wind effect would have shortened the time interval Birdsville-Alice by about 36 minutes. This explained the navigational error, which only became apparent at ETA Geosurvey Hill.

Navigating for long periods over featureless terrain can be a demanding exercise, invariably requiring meticulous preflight preparation for successful completion. *In these circumstances, attention to weather must be even more thorough than ever. While weather forecasts may be tempered by in-flight observations, a sound understanding of the total meteorological situation — not just selected items — is essential. The presence of the trough near the planned route should have been a factor to be considered by the pilot when the change in altitude was required.*

and from *ASD 55*

...and behind all the events and circumstances that led to this catastrophe ***there is the fact that the pilot was inexperienced in the ways of the north's wet season and the particular hazards presented over featureless areas with great distances between even emergency landing places.*** *It is vital for all pilots to realise* ***that weather conditions likely to be encountered in the northern wet season, especially during late afternoon, can be a very different proposition to the thunderstorm-type weather normally encountered in southern Australia,*** *and diverting to another airfield usually involves long flights over country where map-reading is most difficult.*

The second component of weatherwise flying is being able to recognise in flight the early signs of hazardous meteorological conditions and take appropriate action. Signs associated with many hazardous conditions (microbursts, mountain waves, thunderstorms, dust-devils etc) and recommended courses of action were discussed in *Digests* commencing Winter 1988. It is particularly perilous to ignore signs such as the lowering and thickening of cloud, a line of heavy dark clouds or roll cloud. The best safeguard in these circumstances is probably a 180 before the aircraft is enveloped in bad weather and circumstances develop that are beyond the control of the pilot.

Finally, in-flight weather reports from aircraft (AIREPS) can provide much valuable data to augment the conventional observational information upon which forecasts are based □

AIRFLOW

Dear Sir,

It is disturbing to read in the latest *ASD* the passage 'the *en route* instrument rating is currently catered for by the Command Instrument Rating, the only safe way to ever consider flight in IMC'.

It is an inescapable fact that in the real world, VFR pilots, if they fly enough, will be faced in flight with non-VFR conditions at some time. It does not matter how prudent, cautious and law-abiding they might be.

It might happen in the first few months of a flying career or it might take 20 years. The frequency is not the point. One event is too many.

When it happens only two courses are open to the pilot. The pilot may be so frightened by the legislative prohibition against flying in cloud that flight is attempted below the cloud base, literally at ground level with the inevitable contact with rising terrain or some other immovable object such as power lines or a radio mast.

Alternatively, the pilot enters the cloud to find he lacks the training and the mental discipline to cope with the situation. It really is quite different to being under the hood in placid conditions for a Biennial review in a C172. The end result is the same in both cases.

Mr Tizzard is correct in pointing out the difficulties of precisely flying an ILS approach and in drawing attention to the fallibility of weather services. He is incorrect when he uses the extreme case as the normal to justify his argument. The overwhelming majority of cases where VFR pilots get into trouble in IMC are occasions where it is not eight octas of cloud from the grass to the stratosphere.

It is totally impracticable to say to VFR pilots that they must go to the exorbitant expense of over thirty hours training, frequently in a twin, to get a command rating and then face the cost and stress of constant licence renewals. It is also unnecessary because they are not going to captain an airliner in CAT III conditions into Sydney.

Most VFR pilots are responsible and will not depart or continue flight in solid IMC. If they are that obtuse they would almost certainly have been killed on the roads years ago.

The consequences of the present policy are stark and unambiguous. More lives are lost through an inability to fly for a short period on instruments than messing up an instrument approach.

While being fully conscious of the need to have the skills required to safely terminate a flight, there has to be a facility by which VFR pilots can safely and legally fly without visual reference to the ground for some short period.

Senator David MacGibbon

Steve Tizzard ripostes:

Senator MacGibbon's letter is in response to an article in ASD 145, where I stated the CAA's opposition to an 'en route instrument rating'.

Alas, his comments, which I sincerely hope are not merely disingenuous, serve only to strengthen my views on this matter. As written, the letter makes it difficult to ascertain whether the author has any flying experience or whether he wrote to us solely on the advice of his constituency.

This subject is so serious that I shall deal with the particulars of the Senator's case:

Paragraphs two to five reveal a fundamental flaw in the understanding of what a VFR pilot should do when faced with non VFR conditions. The answer is

- *divert; or*
- *hold; or*
- *conduct a precautionary search and landing (all while remaining in VMC).*

To continue flight in weather conditions which preclude at least one of these options is to court disaster. The CAA insists upon some instrument training in the RPPL and UPPL syllabi in order to teach pilots that the option espoused by the Senator (flight in IMC) is highly undesirable.

I am accused of using an extreme case as the normal to justify the argument. The five hours thirty minutes of unexpected flight in cloud mentioned in my article was not an extreme case — I could cite many other instances of extended, unforecast IMC. It was, however, some five hours twenty seven minutes or 11314% in excess of the average time (175 seconds) the untrained instrument pilot lasts in cloud before losing control of the aircraft.

The Senator further states: 'Mr Tizzard is correct in pointing out the difficulties of precisely flying an ILS approach'. Read ASD 145 again and you will see that I implied almost exactly the opposite!

The statement regarding where a VFR pilot gets into trouble is incorrect. It is not overstating the case to declare that the problem invariably stems from a loss of visual contact with the real horizon and is frequently compounded by casual factors.

The facts of the matter get a bit of a serve in the Senator's fourth last paragraph; there are certainly four misstatements, and I may have missed others.

'Most VFR pilots are responsible . . .' is an indictment against the intelligence of VFR pilots.

AIRFLOW

I have great delight in finally finding some common ground with Senator MacGibbon on this issue, for his assertion that 'The consequences of the present policy are stark and unambiguous' is entirely correct: current procedures have been formulated by pilots with skill, knowledge and much experience. We plead with you to stay out of cloud unless you hold an instrument rating.

The Senator's conclusion again misrepresents the facts; legislation already exists whereby 'VFR pilots can safely and legally fly without visual reference to the ground for some short period.' Up to two hours, in fact — but not in expletive deleted cloud, thank you very much.

Dear Sir,

There probably isn't a pilot around who at some time or another hasn't been disenchanted with ATC or Flight Service. We all know the stories that are so often repeated whenever pilots get together, clearances that aren't available when expected, time spent in holding patterns waiting for some controller to get his act together, and, even worse, incident reports filed against you by ATC or FS for some petty oversight on your part as pilot. Yes we've all enjoyed a 'whinge' session at the CAA's expense at some time or another. A recent experience clearly reminded me, however, that the people pilots like to complain about the most are, in fact, very dedicated professionals.

Over the last weekend in February a very big airshow was staged at Ballarat, Victoria. By a fortunate combination of circumstances I had a pristine Cessna 170 to take to the airshow from Moorabbin. The flight on the Saturday was uneventful and a great time was had by all; on the Sunday another air display, followed by the hour-long flight back to Moorabbin.

The departure was very much a 'take your turn' affair with so many aircraft departing in a short time-span. As many aircraft were heading to Moorabbin, I well knew that the area frequency of 124.9 would be really busy and that Moorabbin would be 'delayed' by arrivals — not a problem if you take your time and stay ahead of the aeroplane. But situations can change.

The flight was proceeding normally until abeam the small town of Wallace, whereupon the over-centre latch mechanism on the pilot's door window failed. The window flew open, alarming everyone, especially my young daughter in the rear seat. The slipstream was so powerful that my wife, in the right hand seat, had to take temporary control while I wrestled the window shut. Once closed the only way to keep it secure was for my wife to reach around behind the pilot's seat and hold the latch down with her hand. And there was still 30 minutes to Moorabbin!

As the flight continued Melbourne FS did not acknowledge any of my position reports or ETAs, but I was not overly concerned as the area frequency was really busy and I guessed the FSO was probably a bit over-stretched.

Once we were abeam Westgate I changed to Moorabbin ATIS, noted the details on my flight plan and changed to the West Arrivals and Departures frequency of 123.0 and was it busy! Over Brighton I attempted to contact the Tower with my inbound call but had to wait for a break in radio traffic to do so. Finally I made a transmission but the radio didn't have my complete attention, as the traffic was the busiest I had ever known in the Moorabbin area — it really was 'see and be seen' stuff. I sure was grateful for my years as a glider tug pilot, where we used to fly in busy circuits constantly and had to be conscientious about outside surveillance.

The controller was now advising an aircraft that its transmissions were faulty and he was only getting the initial microphone 'click'. He asked if the aircraft was inbound and if so to respond with three clicks. Seconds passed — nothing — but wait, he hadn't acknowledged my inbound call! More traffic reports came in and I began to feel uneasy as I waited a for a further traffic break to try again. By now I was halfway between Brighton and Moorabbin itself. The second try dispelled all doubt, the controller coming straight back advising that he had received nothing but an initial microphone click and asks again for three clicks if the aircraft is an inbound arrival. It had to be me, and I felt perhaps it wasn't my day — the window episode was proving enough unplanned excitement.

Quickly now I punched off three clicks and prayed silently he would not be annoyed that I didn't respond to him in the first instance. Questions raced into my mind: Would he divert me? With this traffic he had the right to remove a virtual no radio aircraft out of the control zone. Should I divert automatically? Berwick wasn't too far away — we could get back to Moorabbin some how to collect our car. The aeroplane could be ferried back later after the radio was made serviceable again.

Back came the controller and asked me to join the circuit area but to remain at 1500ft, overfly the tower then maintain an upwind heading. He obviously wanted to get a look at me before his next instruction — was this the first step of an

AIRFLOW

incident report he intended to file? Three more clicks on the microphone button acknowledged his call.

As I approached the tower, several aircraft were already in various stages of the circuit and while it may have been very busy at 1000ft it was very lonely up here at 1500ft. I slowed down to 80 kt to give the tower staff a good chance to read my callsign and awaited the next step. It wasn't long in coming . . .

The controller read out my callsign then asked me to confirm, with the now customary three clicks, that I'm the radioless aircraft. From that point events proceeded something like this:

Do not acknowledge any further transmissions, maintain your present heading and descend to 1000ft. When advised turn right on crosswind leg. All traffic Moorabbin circuit area be advised a Cessna 170 taildragger type aircraft is joining the circuit without radio capability.

A few moments later:

Make right turn now and establish visual contact with a Baron on downwind; he is approximately one nautical mile ahead of you now.

The big Beech was exactly where the controller said and it crossed my path just as its gear was starting to extend. I was amazed that the controller found time and opportunity to issue such detailed instructions in the face of a very high workload. He had at least five aircraft (and me) actually in the landing pattern and four, or more, others had made initial inbound contact with him over the last few minutes.

Again the controller came to my aid in guiding me around the circuit:

Turn right on to downwind leg, there is a Cherokee six approximately one and a half miles ahead of you and the Baron is turning onto final approach at this time; you are number two to land, behind the Cherokee.

This was very welcome and most unexpected; I'm was virtually given circuit priority and that's far different from being directed out of the control zone. Later in the approach the controller asked me (note: *asked* not told) to extend my downwind leg to allow three Pitts Specials to land ahead of me, thus decongesting the circuit area overall. This was easily accomplished with no effect at all on my approach. After landing and securing the aircraft I called into the Briefing Office to say thanks. The officer on duty simply replied *No worries, that's all part of the service.*

'Service' indeed; that ATC officer had no way of knowing that I had one very tired wife jamming a window shut for me. He couldn't have known that my car was at Moorabbin and a diversion would undoubtedly add hours to the time that we would eventually get home (and all that with two very young and very tired children). He couldn't have known that the operator was planning to do some work on the aeroplane the very next morning and that an 'outside' tradesman was making a special journey to do the work — very embarrassing (and costly) if you have to cancel such an arrangement because the aeroplane isn't available to work on.

So just remember — should you ever have a genuine 'beef' against ATC or Flight Service there are official — and effective — channels available to do something about it. However, when a pilots' clubhouse or Briefing Room 'whinge' session starts up, just think of the times when ATS went out of their way to help — and throw it in to balance up the perspective for all concerned.

Afternote:

The above took place on February 25th at about 1800LMT on Arrivals and Departures West frequency 123.0. Regardless of whether the foregoing is established or not I should be most grateful if my vote of thanks could be passed along through the 'system' to the individual concerned. Oh yes, the aircraft was VH-HSV.

Gary Crowley

Moorabbin ATC spokesperson says:

It is pleasing to read contributions from pilots that confirm procedures working as designed. Even more pleasing is Mr. Crowley's feeling of having received a good service, and on behalf of the controller on duty, I thank him for his kind thoughts.

The lessons for us from this article?

- *The absolute importance of the controller/pilot working relationship to ultimate safety ie; a partnership based on mutual respect and common sense.*
- *The dangers of talking ourselves into a state of mind. Because the pilot expected radio traffic to be heavy on the FIA frequency, the unacknowledged calls failed to alert him to the radio problem at an earlier stage.*
- *If the aeroplane is fitted with a transponder, then remember to squawk code 7600. The pre-warning our radar colleagues can provide as a result makes life that little bit easier.*

AIRFLOW

Dear Sir

Can you trust a Primary FS forecast (Primary Zone)?

As a PPL I enjoy reading the *Safety Digest* and ponder the dilemmas of other pilots. Some of the incidents hit pretty close to home, and I know the feeling that you can get in the pit of your stomach.

I read in your 1990 Autumn edition of the pilot examining a dry tank and only later wondering just how the previous pilot flew in on such bare bones. I am a class 4 NVMC rated pilot and I know that dry tank feeling.

A potential disaster was clearly demonstrated to me several years ago when some friends and I decided to fly from Jandakot to the Birdsville races in outback Queensland. I flew a Mooney 201 — a delight for speed but not for comfort.

I just squeeze in at 20 stone on the old scale; my two friends were thankfully both beanpoles and lightweights.

The flight across the desert was uneventful and having to fly over cloud and get positive fixes every 2 hours was a challenge I enjoyed. I was only ever two miles off track, so I was pretty happy with my nav. Now the aero club where I was taught to fly, like most schools, gives out little helpers like **PUFF** and **CLEAROF**. Also, I've always had it drummed into me to calculate fuel and distance to the gallon and the minute. Nowhere did I need it more than on the trip out of Birdsville. By my calculations I had 55 minutes of fuel upon arrival at Birdsville. After 3 days of fun, fights and races we were ready to leave.

First thing, a flight plan. Second, how much fuel will I need? Well you can't use a carnet card at Birdsville and the horses had been less than kind to me but I knew I could get fuel at Coober Pedy on the card. However, the fuel operator was charging like a wounded bull at $1.00 per litre. After figuring out fuel for a 90 minute flight at 8.5 gph I calculated 13 gallons or 58 litres. I worked out I still had 55 minutes or 8 gallons or 36 litres still in the tanks. So needing 135 minutes of fuel I calculated I needed 86 litres to get me to Coober Pedy, so I bought 50 litres. I was right on the nose for fuel plus reserve.

We were 2nd in line to take off at first light and it was really quite spectacular to see 30 to 40 aeroplanes lined up behind us blowing up a duststorm.

We took off about 0605 local and proceeded on track to Coober Pedy. I work on the **CLEAROF** method and use 10 minute sections to calculate fuel, position etc. On the climb I lose a bit and pick it up on descent, so for the first 20 minutes I expect some variations or discepancies. At the 30 minute check I started to get an uneasy feeling that perhaps things weren't quite right; maybe the forecast wasn't too accurate.

We weren't where we should have been and I was getting positive fixes due to the unusual terrain. The plane was operating correctly, she was trimmed and leaned out to the maximum. The further we went the further my doubts grew. Shortly we would reach PNR and a decision would have to be made. I calculated that, instead of the 20 kt tailwind forecast, I was copping a 30/40 kt headwind. I checked the forecast again to see if I'd got it wrong, but no, my calculations were right in line with what met. had said. It was a bit hard to start cursing the guys at the FS while you're trying to think quick; anyway the only thing I could think of started with 'F'. Oodnadatta was starting to look good and fuel and distance checks took priority over profanities.

Still 50 minutes to go and we should get down with 30 minutes fuel spare. Now 30 minutes approx. and only about 20 minutes to spare. God! the headwind is still increasing!

20 minutes from Coober Pedy I put her into a gentle descent and cut the power back a bit but maintained airspeed.

I can see Coober Pedy and we're about 10 minutes out and by my reckoning I've about 10 minutes of fuel over that required. I'm trying to hold that 10 minutes in the left tank in case the right one runs out so I'll at least know there's 10 minutes to get her down on a road or something.

I was never so happy to see that runway on my wingtip. Downwind, then as I crossed the threshold the fuel light was flashing low fuel. That feeling when we touched terra firma was one of unbelievable relief.

When I look back I'm ever so grateful my instructor told me **CLEAROF, PUFF** on final, and **check fuel and position every 10 minutes.**

Afternote:

Can we trust the forecast? Usually we can, but I keep a check myself just to make sure. And yes, the tanks were so dry the dipstick didn't register any fuel at all. (At Birdsville due to the number of planes coming — about 400 — they set up a Primary Control Zone for those 3 days).

M J Donnes

Field Office Forum

Danger in numbers

John McQueen, E of A (GA),
Safety Promotion Officer CAA NSW

WE ALL KNOW the strength of teamwork and that two heads are better than one, but have you ever stopped to think that this is only true if the correct principles of teamwork are applied? If they are not, there is definitely danger in numbers. Let me explain:

Have you ever observed the behaviour of a group? A crowd of teenagers on the train? A sporting team in the pub? The office party? Groups demonstrate markedly different behaviour-patterns to those followed by their members acting as individuals.

Why is this so? Well, there are a number of reasons and it's important that you understand them if you belong to any organised group, say an aero club or parachute club or if you are engaging in any organised activity like a safari. Should you be a member of a flight crew, you must be particularly aware of some team characteristics that can be dangerous.

Negative aspects of team action are known in psychological jargon as *groupthink* and arise because each member subconsciously wants to nurture the nice secure feeling experienced in being part of the group. I'm sure you can think of examples you have seen or perhaps been involved in yourself. Let's run through the symptoms:

Invulnerability — *We Can Do Anything*

The group shares the illusion of impregnability; this can lead to over-confidence and a willingness to take unnecessary risks. There may even be a failure to respond to clear warning signs of danger. I'm sure you've all competed against the 'A' team — you know, the ones who know they can't be beaten at anything!

Rationalisation — *She'll Be Right Mate*

Rationalisation is when you attempt to defend your actions by a process of selective justification — that is, eagerly accepting reasons for doing something while ignoring indications that perhaps you should think it through at least once more. A group is particularly prone to rationalisation because each member can usually think of something to support a desirable course of action. In reality, though, they may be putting themselves into a situation an individual would recognise as perilous. Of course, this is not confined to group action — *gethomeitis*, particularly when there is no-one else in the aircraft to counsel otherwise, is a prime example of bad rationalisation. However, it is the cumulative effect of artificially positive opinions that is so insidious in groupthink.

Morality — *Anything Goes*

Members of a group can begin to believe in a joint inherent morality that differs from their personal standards. This belief can cause members to ignore the ethical or moral consequences of their actions. This symptom is very prevalent with sporting teams (*win at any cost*), but could apply to an aviation group (*we're here to make money*) and cause it to disregard SOP's or regulations.

Peer pressure — *We're All In This Together*

If an individual has doubts about the decisions made by the majority, there can be direct pressure applied to achieve a change of mind. This type of behaviour is vividly illustrated in the movie *Twelve Angry Men*, which shows such pressure affecting due process by a jury in a seemingly open-and-shut murder case. Junior members of flight crew can be very susceptible to peer pressure unless crew discipline reinforces their training.

Time pressure — *Let's Get On With It*

When making a decision, members of a group are often more concerned about the constraints of time than the quality of their conclusion. For some reason time becomes more important than the task. The group can start to become anxious if a decision isn't made quickly and will accept the first suggestion that comes along, even if it suspects that there may be serious repercussions later on.

Filtering — *No Problems!*

Some members of the group subconsciously (or even consciously) regard themselves as minders to protect the leader and other members from information that may destroy apparent harmony and wellbeing. Taken to extremes this could involve not giving the leader information vital to the group's security.

These are the main symptoms of groupthink. What can we do to counteract them? The answer lies in good leadership. Leaders must use their influence to encourage, motivate and stimulate people to do things. There is no set way to achieve this, but the key factor is the relationship between the leader and the team members. A good relationship with a trusted and respected leader makes the exercise of good influence and authority very much easier.

Self-censorship — *What Would I Know?*

If the group has made a decision, there is a tendency for an individual to keep quiet even should doubt exist. They may even try to convince themselves that they can't be right because the group must know best. It could be described as a subtle kind of peer pressure, inhibiting an individual from even beginning to question anything that is supported by an apparent strength of numbers.

Unanimity — *If We All Agree, We Must Be Right*

The effects of unanimity are partly caused by self censorship. If an individual remains silent during the decision-making process the group can make the false assumption that everyone is in full agreement. The resultant illusion is therefore shared by most members in any judgement expressing a majority view.

Good leaders

- understand the correct process for decision making
- try to involve every member of the team because everyone has something to contribute — it may only be one piece of information but the one that is vital to the success of the mission
- allocate duties to the most appropriate person and recognise and respect their expertise
- communicate clearly and supervise fairly by acknowledging a good performance and correcting a poor one
- focus on individual needs so that everyone can develop knowledge and skills.

A team that is contributing, well-led, committed and aware of the dangers of *groupthink* can be very effective in achieving the task. It can demonstrate that there is also safety in numbers — and unlimited potential □

NIL DEFECTS

Rats in the airframe

Ralph Murphy, Senior Airworthiness Engineer
Aircraft Structures

MUCH AS ANCILLARY aircrew may argue the point, we're not here talking about pilots. *Rodo, rodere, rosi, rosum,* are parts of the Latin verb 'to gnaw', and it is no mistake that this has been used to form the stem of the words 'rodent' and 'corrosion', for both of these can surreptitiously eat away those things we hold vital to our well-being.

Q. *Why do metals corrode?*

A. Entropy (look it up). The ores from which the end-product is refined have probably lain in the earth for millions (billions?) of years, and the process of disorganisation that entropy pursues is very well advanced. To such an extent, in fact, that the ore is an extremely stable substance. Left alone in the ground it probably wouldn't change for another few hundred thousand years.

But, contrary to what appears obvious, metal as we know it, having had much energy expended on the refining process, exists in a highly reactive unstable state. It spends its time, if you like, trying to return to chemical stability — back to an ore, in fact (see again entropy). Given a bit of help from chemical or electrochemical action — and an electrolyte can be as simple as mere water with some dissolved impurities — your lovely alloy will happily revert to oxides, hydroxides and sulphates etc.

This quite normal atavistic process is bad news for us, and is described in scathing terms as 'rust', 'scale' or perhaps 'corrosion products'.

In aviation, we are most suspicious of corrosion because we continually seek to produce aircraft materials with higher and higher strength-to-weight ratios. The downside is that in many cases such materials have very poor inherent corrosion resistance. Thus, the prevention, or at least a deceleration of corrosion is crucial to the integrity of all aircraft structures.

Corrosion prevention on aircraft is initially achieved by:

- careful selection of materials
- corrosion control treatments such as plating, anodising and painting
- special assembly techniques
- careful detail design

However, the long-term effectiveness is determined by the maintenance of the aircraft. Owners and operators must ensure:

- adequate cleaning of the aircraft
- early recognition and treatment of corrosion
- restoration of paint systems
- cleaning up spillage of corrosive substances
- drainage and removal of trapped moisture

Corrosion, very like cancer, can be kept at bay by wise preventative procedures, and may be cured completely following *early* detection and treatment.

Any unexpected or unusual corrosion should be reported to the CAA via a Major Defect Report (MDR) so that the CAA can investigate any pattern that emerges and can help other owners and operators.

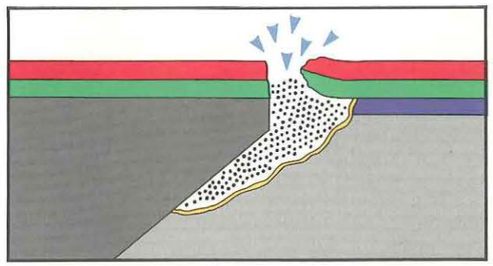
NIL DEFECTS

The most common forms of corrosion are:

Galvanic:

Symptoms: Powder-like white or grey deposits.

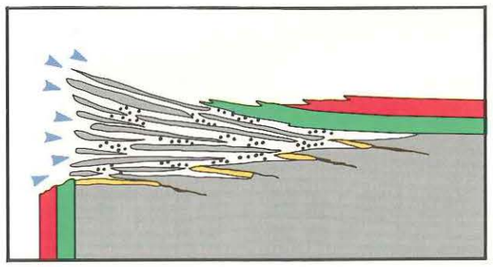
Cause: two dissimilar metals in contact in the presence of an electrolyte. Carbon fibres (as used in some advanced composite materials) in contact with metal can also set up galvanic corrosion.



Exfoliation:

Symptoms: Flaking and loss of metal through the thickness of the material.

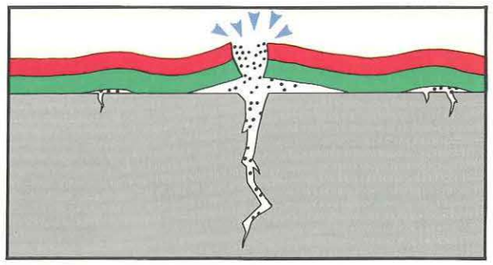
Cause: Corrosion proceeds from exposed grain ends along planes parallel to the grain surfaces. The swelling of the corrosion products forces metal away from the body of the material giving a layered appearance.



Stress:

Symptoms: Usually only noticed as cracking, with fast crack growth and possible subsequent failure.

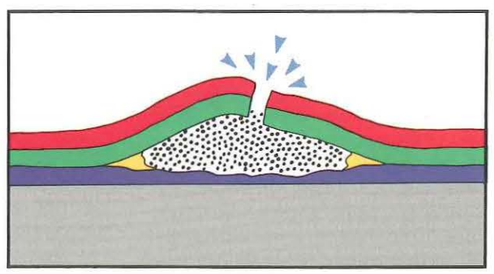
Cause: Sustained tensile stress in a corrosive environment.



Filiform:

Symptoms: Corrosion occurring beneath paint in the form of random threadlike filaments. Often causes paint bulging as blisters.

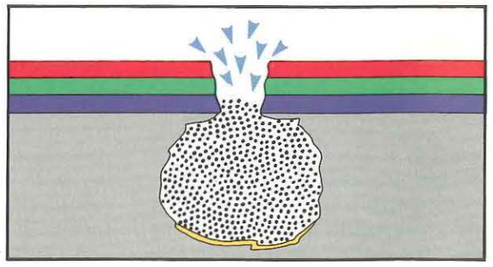
Cause: Moisture and corrosive agents that reach the metal through cracks or damage in the paint and set up active corrosion cells. Particularly severe in high humidity, marine and industrially polluted environments.



Pitting:

Symptoms: Localised pits or holes in the surface of the material. Can be quite deep and serious.

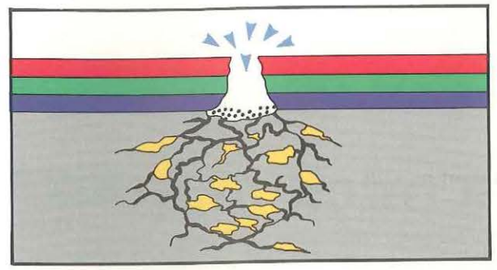
Cause: Corrosive agents setting up small electrolytic cells. Surface should be clean and the surface coating kept in good condition to minimise the risk of pitting.



Intergranular:

Symptoms: Usually only noticed as cracking. It is typified by an apparent increase in the corrosion rate with time.

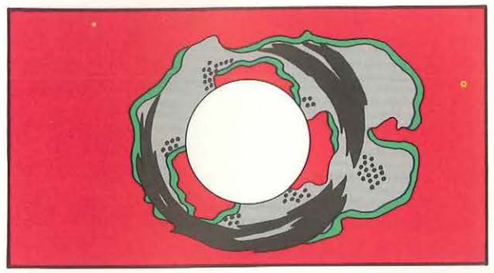
Cause: Chemical and electrolytic action along grain boundaries in the material; some alloys are highly susceptible to this action. Breakdown in the surface coating can allow moisture and corrosive agents to enter.



Fretting:

Symptoms: Combined wear and corrosion between contacting surfaces which are subject to slight relative movement. Ferrous metals often show red material oozing from between the surfaces and light alloys display black deposits and/or streaking.

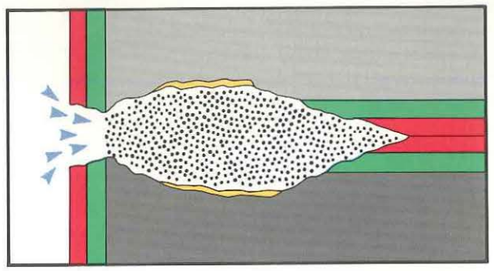
Cause: Abrasion of metal under load in a humid environment



Crevice:

Symptoms: Severe localised corrosion at narrow openings or gaps between metal components.

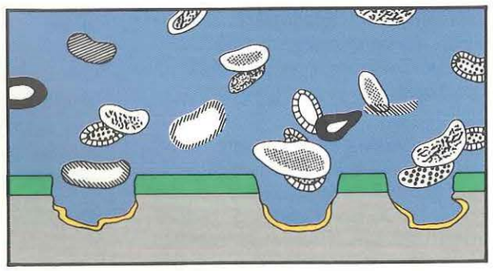
Cause: Penetration of a corrosive agent into a joint, often due to flexing. Faying surface sealants should be correctly applied.



Micro-biological:

Symptoms: Local surface attack or formation of deposits such as fungi.

Cause: Growth of micro-organisms in moisture traps. Occurs predominantly in aluminium integral wing fuel tanks that use kerosene based fuels. The organisms feed on the tank lining, exposing the structure to electrolytic attack.



These represent perhaps the most common forms of corrosion; there are many others that can occur under given conditions. However, whatever the particular variety encountered, effective treatment, as said earlier, begins with accurate reporting and prompt counteraction. Look carefully; look again — then do something about it!

Grateful thanks for the ideas and particularly for the pictures to:

FAST, Airbus Technical Digest

Airbus Industrie Product Support

Blagnac, France □

NIL DEFECTS

'You scratch my back . . .'

Warwick Bigsworth

Manager, Sydney Airport Capacity Enhancement

IN EARLY 1989 I had the opportunity to lead a small group of very experienced Australian Air Traffic Controllers on a visit to several North American airports. The purpose of the visit was to see if we could learn something from the Canadians and Americans about efficient airport operations and reducing delays, and to put such practices, procedures and standards into effect in Australia.

I hope and expect that most aircrew and air traffic controllers will have already noticed some recent improvements to the efficiency of the air traffic services system; these have resulted from recommendations arising from the visit to North America. Improvements to SIDS, more realistic runway selection criteria, revised wake turbulence separation standards, new simultaneous runway operations standards and improvements to the ATC management structure are all items which have been introduced or will be introduced by the end of 1990. The industry and the CAA are also considering recommending to Government means to improve noise abatement procedures, recognising that many of the restrictions were imposed in the late 1960s and the improvements to aircraft noise emissions and performance, whilst also ensuring that the community is not adversely affected.

Perhaps the most outstanding revelation to my group was the attitude and esprit de corps between North American aircrew and air traffic controllers. Readers will be aware of the enormous amount of air traffic processed in North America and the need to keep aircraft moving whilst minimising delay. One important item which is necessary to achieve that is the joint effort required in co-operation by pilots and controllers.

There are a number of important items which the air traffic controller can do to make an airport and airways system work more efficiently, particularly in keeping the pilot informed. Consider how many times on departure you as a pilot have just selected parking brake on, when only a moment later you are cleared for take-off or to line up. How often have you reported ready or leaving an altitude and there has been either a long delay in, or no acknowledgement from ATC? Have you:

- ever just commenced descent on profile and suddenly have been told by ATC to reduce to 60 kt below your desired optimum speed?
- been caught in the position of being at 3000 ft and 7 nm from touchdown in an unpressurised aircraft and then asked to make a short approach, and keep the speed up?
- ever just entered the holding pattern, only to be told to cancel holding and resume desired speed?

Do some of these scenarios sound familiar? If only you had been given some forewarning, you might have been better equipped to comply. On the other hand, controllers don't issue instructions without valid reason, but forethought and keeping pilots informed obviously gives them a better chance of ensuring a smooth, safe operation.

But how does the controller feel about some of the things that pilots have been known to do?

- When your aircraft is cleared for take-off, do your take more than just a few seconds to roll?
- When you are at the holding point and have been cleared for take-off, do you line up and stop?
- Do you land and use minimum braking just for your own convenience?
- Do you always try to vacate the runway on the first available taxiway?
- Do you argue or whinge over the radio?
- Do you advise you require a different runway when you are arriving at a major airport and only have a few miles to run for the nominated runway?
- When operating outside radar coverage, do you always advise ATC of amended ETAs?
- Do you readback clearances, assigned levels and transponder codes?

I'm sure that most controllers will be very familiar with these frequent occurrences.

In North America, the above problems rarely occur because there appears to be a better level of co-operation and understanding between controllers and pilots. It seemed to us that everyone wanted to ensure that they did their part in contributing to a safe, orderly and efficient flow of air traffic. If pilots or controllers don't fulfil their obligations and compromise the safety or convenience of others, he's made well aware that he could be the victim on another occasion.

The following tips, if regularly practised by pilots and air traffic controllers, would make a significant contribution to the safe, orderly and expeditious flow of air traffic at Australian airports.

GROUND TO AIR

Air Traffic Controllers:

- Keep the pilot informed; the pilot cannot read your mind, so, for example, when you want an aircraft to roll as soon as the runway is clear, give the pilot that expectation.
- Advise speed restrictions as early as possible; it can be quite difficult to descend on an acceptable profile if late notification of speed restrictions are made.
- Don't forget to give the pilot track miles to run; the pilot can then gauge the rate of descent in a more precise manner (it contributes to noise abatement as well).
- If you need the aircraft to expedite, tell the pilot; a pilot will vacate the runway quick smart if he knows there is another aircraft close behind.
- Endeavour to keep taxiing aircraft moving; be prepared for those 'ready' calls and ensure departures clearances are at hand. Think ahead.
- Endeavour to use speed control rather than holding; with a bit of forward planning most pilots will reduce en-route cruising speed much more happily than having to enter a holding pattern. It usually saves fuel and reduces workload on the part of both controller and pilot.
- Keep in mind the relationship of miles to run/speed/altitude; this applies particularly to non-pressurised aircraft, but can cause significant difficulties to pressurised aircraft as well.
- Try not to cancel a SID in the same breath as clearing an aircraft for immediate take-off; the pilot has set up the instruments for a SID and no doubt has gone through a briefing on the same. There is a good chance he might not be able to expedite take-off safely.
- Advise the pilot of the reason for a delay, if it is not otherwise apparent; if the aircraft is at the holding point and reported ready and there does not seem to be other movement, explain the reason for the delay. Similarly, when the Approach frequencies are split and your one aircraft is being delayed by speed or radar vectoring, give its position in the sequence and expected landing time.
- Use correct and courteous radio procedures; don't shortcut call signs or clearances, and if extra advice to pilots is necessary, do it post-landing over the telephone. 'Good morning' or 'good afternoon' never causes offence.

Pilots:

- Enter and vacate the runway expeditiously; if you have reported ready, ATC expect you to move onto the runway as soon as cleared. Long landing rolls just to save the brakes or to get closer to your terminal only delays the aircraft behind you. Tomorrow it may be you who suffers.
- Commence rolling immediately when cleared for take-off; when cleared to line up you should be spooled up, checks complete and ready to go.
- Advise ATC as early as possible when you require a runway other than that nominated; it is no use expecting original priority if you suddenly advise that you require a runway contrary to the traffic flow.
- For departure, advise ATC at or before clearance request; on arrival, preferably prior to top of descent.
- Don't whinge or argue over the radio; human nature being what it is, arguing will only create acrimony. If you have a legitimate complaint, telephone ATC after you have landed.
- Provide the earliest revision of estimates; when outside radar coverage your Sarwatch and separation is dependent on your navigation and estimates.
- Read back clearances and assigned levels correctly; abbreviated readbacks can lead to misunderstandings and incorrect assumptions.
- Use correct and courteous radio procedures; short cuts cause confusion and can lead to incidents.

Many pilots may not be completely familiar with the CAA's Air Traffic Services system. Nearly everywhere pilots are welcome to visit ATS facilities and see how the system works. A call to the local ATS Manager will usually get you an invitation to the Unit or Centre at a mutually convenient time. Such a visit might lead to a better understanding. Certainly, as was said in a recent *Digest*, it'll score you a cup of CAA coffee!

[Has anyone else noticed the extraordinary politeness and patience of the average American car driver? Even on the spaghetti junctions of Los Angeles? Could it be that Australian driving habits reflect a national characteristic? Does our closely-held individuality and, let's admit it, our aggression, spill over into our behaviour as pilots and Air Traffic Controllers? — ed] □