Aviation Safety Digest

ASD 141

WINTER 1989

GAAP PROCEDURES VMC - DAY

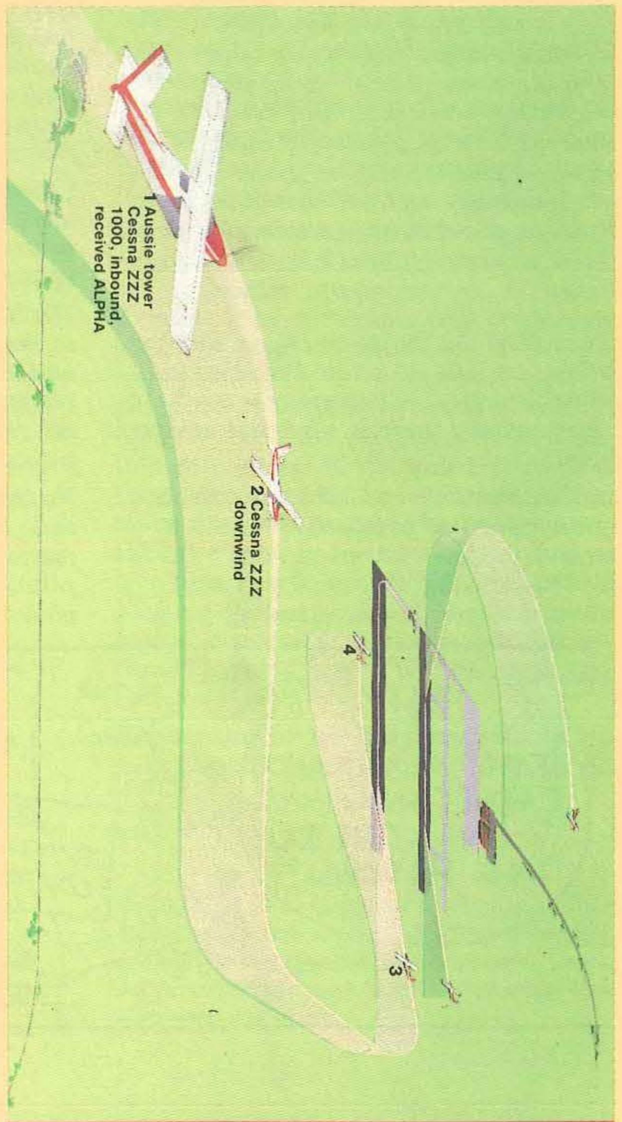
arrivals

1 ATIS, altitude, lane of entry, initial report to tower at ⇨

2 Check local procedures to overfly, circuit direction. Abeam upwind end — descend to circuit height, make downwind report.

3 No base call but landing clearance is required.

4 Go-around active side — climb to circuit altitude, rejoin circuit upwind.



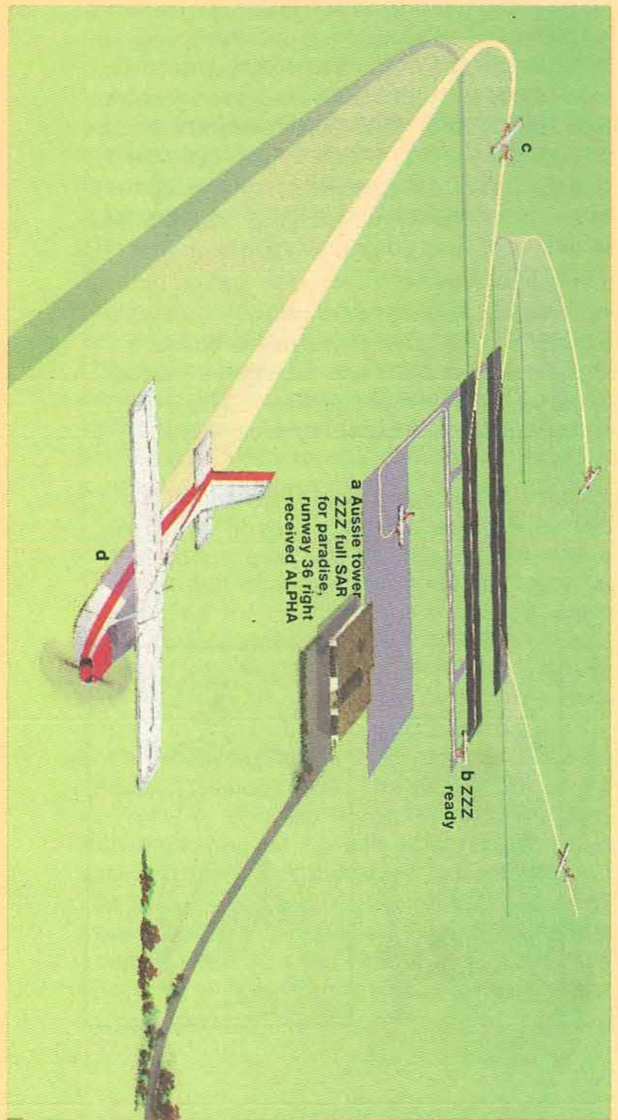
departures

a ATIS, report taxiing

b Report ready

c Depart zone by extending leg — runway heading, cross or down wind remain clear of LOE and ⇨ Endeavour to be above 1000ft by boundary — check local procedures

d Establish communications if required with appropriate agency.



cautions

1 Check local procedures for entry / exit through CTA

2 Pilot is required to sight traffic and maintain separation

3 Notify ATC if unable to comply or sight traffic.

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The views expressed in the Aviation Safety Digest are those of the editor or the individual contributor and are intended to stimulate discussion in the fields of aviation safety and related areas. They do not necessarily reflect the policy of the Authority. The articles are intended to serve as a basis for discussion and even argument in an effort to identify and resolve problem areas and potentially hazardous situations.

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.

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Statement by Alan Heggen, Group General Manager, Safety Regulation

Having been invited to contribute an 'editorial statement' to this issue of the *Aviation Safety Digest* and having joined the CAA as recently as 6 February I quickly concluded that the most useful contribution I could make would be to devote my allocated space to introducing myself. While it might not rate among the more appealing items in the *Digest*, it is at least a matter of which I have some knowledge.

Just over a month ago I assumed office as Group General Manager, Safety Regulation. My predecessor in this position was Mr R.C. (Jerry) O'Day — a man who is, I am certain, extremely well known to the more seasoned readers of the *Digest* as a most professional, colourful and dedicated advocate of the science and practice of aviation. I am indebted to Jerry for the very fine shape in which he has handed-over the Safety Regulation Group.

Like Jerry's, mine is a military background. I spent a little over 40 years in the RAAF where, in those days when the opportunity presented itself, I flew as a Navigator on aircraft of types which today evoke emotions of nostalgia and discomfort among the over-50s and polite curiosity among the turbo-fan, titanium and ring-laser community. Nevertheless, the past 20 years of my Air Force career has been in positions (some more senior than others) in and around the Department of Defence, which have called for management and marshaling of often dissimilar interests towards achievement of a common objective. I suspect that experience will bear some relevance to the regulatory process in which I am now privileged to find myself.

Those readers who are familiar with the folk-lore will also appreciate that, despite first appearances, assumption of this office by a Navigator might not be entirely inappropriate. After all it might be said that I have, in one way or another, spent most of my career looking after pilots, protecting them from the elements, exotic distractions, and, more particularly, themselves.

Whether you are inclined to believe that or not, you may be assured that my days of active navigation and my more recent experience in what we tend, only half disparagingly, to term 'the bureaucracy ' have convinced me that the successful conduct of any useful enterprise invariably relies on the performance of its 'crew' in an area that has come to be termed 'risk management'.

The connection between 'risk management' and 'safety' is plain. Aviation, like motoring, like crossing the street or even stepping out of the shower, involves some risk.

It is in the nation's interests that the aviation industry should prosper. It is in the public's interests that while we are all sharing in the fruits of national development, we should not be placed at undue risk to life, limb or wallet. It is Governments' responsibility to put in place legislative and management arrangements that have regard for the well-being of all concerned and for our position in the world arena. Somewhere in the midst of those various objectives stands the regulatory process, striking a sensible balance between the pursuit of absolute safety for the public and viability of the aviation industry. It is a challenging prospect, but as readers will know, is not one that we are any longer free to pursue regardless of cost. We must look to our own business strategy if we are to provide a service to Government, Industry and the public that is marketable and affordable in all three dimensions. In short we have an omni-directional risk management problem.

I look forward to the challenge of that risk management problem. I am sure it is one that we can and must handle in partnership, and I look forward to working with you — at whichever corner of this omni-directional you happen to stand.

Editorial

It is surprising the various ways ice can get you. It can build up on wings and tails almost imperceptibly; it can be there in abundance almost within an instant. It can break off and go down engine intakes. It can block engine air inlets. It can form while the aircraft is still on the ground. And it can choke carburettors.

Because Australia does not usually have the severe icing conditions of many northern hemisphere countries, we are often less experienced at recognising the symptoms and dealing with the problem. To help us safely weather the dangers of this winter, two articles on icing are included in the *Digest*. A further article, 'Don't tell anyone', illustrates the way in which concern for weather problems might well mask more urgent concern for an aircraft problem.

With this edition we introduce a new section — NIL DEFECTS. In this section will be items of interest to both pilots and engineers. The item on replacement parts is of particular interest to everyone involved in aviation. It invites you to question the source of your replacement parts — the supplier, the overhauler and the history of the part itself — is it genuine, is it second-hand and has it been correctly overhauled?

This *Digest* includes a poster covering the basics of GAAP procedures. At about this time, too, the video 'Going To Town' should be with your local Aero Club or Flying School. Why not have a look at the video and fly a GAAP — you'll be pleasantly surprised!

The Winter watchword — Whether. Whether to go or not to go. Don't decide the day before that you will go. Look at the weather **on the day** so that you can be confident of your decision.

Al Bridges
Editor

Covers

Front: All at sea — Bell 206B. Photographic entry by G. Gunning.
Back: GAAP poster — Design by Kathy Walter. Production by Soussanith Nokham.

Pilot-induced electrical failure in controlled airspace

Pilot contribution by Colin Field

THIS IS AN incident which occurred some time ago on approach to Essendon Airport and is a good example of the ways in which multiple, unrelated factors can combine in unexpected ways to cause problems. In this case, none of the *dramatis personae* were in any real danger; however, the necessity to hand-crank an undercarriage down was narrowly averted, and under the circumstances that developed there was some fear that a 'wheels-up' landing would have to be carried out, with the obvious increased potential danger of such a course of action. If proper procedures had been carried out, none of the events described below need have happened.

Background

The incident took place late one winter Sunday afternoon. Our Moorabbin based Flying School/ Flying Club had several light singles available for hire. Two members had hired a Cessna 172, and intended to perform a navex towards the north. Their flight plan included a landing at Essendon, in order to gain experience in operating in controlled airspace.

Several members and employees were lounging at the School when an anguished telephone call was received from Essendon. The C172 had landed without incident, had been parked on the apron there for some time. However, when it came time to depart, the two hapless aviators discovered that their battery was flat, and as a consequence they were stranded. Under these circumstances the method of choice in starting the engine is to 'swing the prop'. As the two crew were not experienced in this procedure however, a senior flying instructor at our school decided that it would be advisable to mount a rescue party to Essendon.

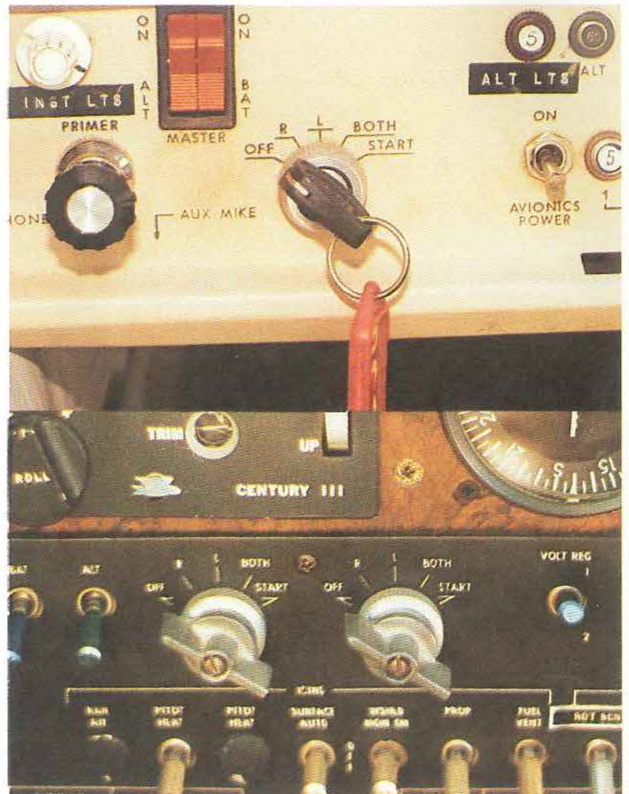
The incident

Three people set out in the school's Piper PA-30 Twin Comanche for this purpose; a senior flying instructor as pilot-in-command, with two individuals who 'went along for the ride' — a student pilot in the right front seat, plus one of the school's newly-qualified instructors in the rear seat.

As the C172 crew was anxious to embark on its navex and return before last light, the PA-30 made a hasty takeoff and approach to Essendon via Westgate Bridge and Flemington Racecourse. Essendon tower gave permission for a straight-in approach on the duty runway. However, on final approach, transmission from the tower became intermittent, and then ceased completely; contact could not thereafter be re-established. The pilot-in-command decided to continue the approach, but when the time came for undercarriage extension, he did not receive green-light confirmation of this event. The aircraft had no choice but to execute a missed approach and track back out of controlled airspace via Westgate, the three occupants keeping nervous eyes out for any approaching traffic.

The pilot-in-command intended to fly back out over Port Phillip Bay and deploy the undercarriage manually, using the emergency undercarriage hand-crank, or, failing this, to perform a wheels-up landing at Moorabbin. He instructed the student pilot, sitting in the right-hand front seat, to unstow the hand-crank and consult the instruction book on how to use it.

At that stage the student pilot, in the right-hand seat, and directly in front of the fuel contents gauges, noted that both indicated empty. He pointed this out to pilot-in-command, adding that he knew the gauges could not be giving accurate readings, as he had visually checked fuel contents as part of his contribution to the pre-flight inspection.



The pilot-in-command concluded that the aircraft had suffered an electrical failure which had effected the radio, undercarriage and fuel gauges. He instructed the student pilot to check the circuit breakers, located under a panel in the floor. The student pilot noted that several circuit-breakers had popped, and, under direction of the pilot-in-command, attempted to push them back in. This could not be accomplished.

At this stage the pilot-in-command noticed that the aircraft's magneto switches had been inadvertently left in the 'off' position prior to takeoff. They were then switched on, and all circuit breakers were successfully pushed in. All electrical power was thereafter restored, with radio communication re-established, and fuel gauges and undercarriage now operating.

The aircraft was turned around and tracked once again to Essendon and the still-stranded C172. Subsequent approach and landing at Essendon, prop-spinning of the C172, and return to Moorabbin were completed without incident.

Conclusion

Magnetos had been left switched off prior to takeoff from Moorabbin. As a consequence, all electrical power for the aircraft was being drawn from its battery. Hence, at a time of high electrical drain (switching on the electric-powered hydraulic system for undercarriage extension), the load on the battery was too much, causing the intermittent and then complete failure of the radio, and the popping of the radio and hydraulic system circuit breakers.

Analysis

Several factors combined to create a potentially hazardous situation. These included:

1. Overconfidence on the part of the pilot-in-command, a senior flying instructor with several years experience, who was perhaps over-anxious in wanting to demonstrate his 'prop-spinning' prowess.

2. Excessive haste used to get the Twin Comanche into the air and over to Essendon. The crew of the C172 were anxious to get their aircraft into the air and to complete the navex before last light. However the Twin Comanche's pilot-in-command should not have felt obliged to apply haste in these circumstances, at the expense of adequate preflight planning and cabin checks.

3. Pilot-in-command's relative inexperience with the aircraft type in which the incident occurred. In the Twin Comanche, the magnetos must be switched on using two toggle switches. Most of his flying experience was in Cessna singles, where magnetos are switched on with a key; hence it is impossible to operate those aircraft without the magnetos being switched on.

4. Poor design of the Twin Comanche's electrical system, which allowed the aircraft to be operated in a mode whereby only the battery was supplying current. This in itself is a neat example of Murphy's Law, which dictates that if a system can be operated incorrectly, it will be.

A timely reminder of the dangers of haste. I wonder, if the rescue to Essendon had been in haste but had been incident free and the haste was an element present during the manual prop swing . . .? □

TAF: Terminal aerodrome forecast

Bureau of Meteorology

What is a TAF?

SIMPLY A TAF is an AERODROME FORECAST, ie a statement of the meteorological conditions expected for a specified period in the airspace within five nautical miles of the centre of the aerodrome or runway complex.

TAFs are presented in coded format so that the format and contents can be standardised and transmission is quick. By presenting the TAF in code and breaking it into component groups, it becomes easy to understand. The diagram below shows the overall structure of the TAF and we will examine each of the components.

TAF or TAF AMD

This identifies the message. The term AMD means the TAF has been amended ie there has been a significant change to part or parts of the previous issue of the TAF for this aerodrome.

Place

The place to which the TAF refers is indicated by either a four letter ICAO location indicator (eg ASBK), the place name, or an approved CAA abbreviation (eg SCN).

Period of validity

The first two numbers indicate the commencement time in hours (UTC), and the last two the end of the period of validity (also in hours UTC).

Mean wind direction and speed of the surface wind

The mean wind (ie the direction from which the wind is coming) is given in degrees true to the nearest 10 degrees and the speed is given in knots; mean wind speeds are given in two figures eg 5KT is given as 05. Calm is given as 00000 and variable direction as VRBL. If the maximum wind speed is expected to exceed the mean by more than 10KT, then this is indicated by a stroke followed by the strength of the maximum wind or gust.

Visibility

This information (in metres) is always given in a four figure group. It is given in increments of 100 metres up to 5 kilometres, and in increments of 1000 metres from 5km to 9km. The code group 9999 is used to forecast a visibility of 10km or more.

Weather

The weather is presented as a group consisting of two figures and a series of letters; the two figures are of interest to meteorological personnel only, and you need only be concerned with the letter group. The groups you are likely to see are:

FU	smoke
HZ	dust haze
PO	dust devils
BR	mist
FG	fog
MIFG	shallow fog
BCFG	fog patches
DZ	drizzle
RA	rain
SH	showers
SN	snow
GR	hail
SA	sandstorm or duststorm
TS	thunderstorm

The qualifier XX means heavy. The above groups may be combined, eg RASH rain showers, XXTSGR heavy thunderstorm with hail.

Cloud

The cloud information is given as a group(s) of the form NCChhh, where N refers to the cloud amount in eights, CC is the cloud type given as a two letter abbreviation, viz

CI	cirrus
CC	cirrocumulus
CS	cirostratus
AC	altocumulus
AS	altostratus
NS	nimbostratus
SC	stratocumulus
ST	stratus
CU	cumulus
CB	cumulonimbus

and hhh is the height of the cloud base above the aerodrome reference point given in hundreds of feet, using three figures eg 001 decodes as 100ft, 050 as 5000ft, 200 as 20000ft.

Information on cloud covers the general cloud distribution of the various layers or masses. The order is such that the lowest cloud is given first, the next higher base second and so on. Cloud details are not given if CAVOK is used.

CAVOK

This term is used when the following conditions are forecast to occur simultaneously:

(i) visibility 10km or more

(ii) no cloud below 5000ft, or below the highest minimum sector altitude, whichever is the higher, and no cumulonimbus

(iii) no precipitation, thunderstorm, shallow fog, fog patches, fog at a distance, low drifting snow or dust devils.

Visibility, weather and cloud groups are omitted if CAVOK is used.

Indicator of significant variation

Because the weather can (and often does) change there has to be provision for this in the TAF code. Reference to significant changes or variations is made if changes or variations in one or more of the elements wind (direction and/or speed), visibility, weather or cloud are expected. It should be noted that these apply to improvements as well as deteriorations.

Indicators of significant variation include:

TEMPO, which indicates a change(s) expected to last for period(s) of 30 minutes or more but less than 60 minutes, but sufficiently infrequently for the prevailing conditions to remain those of the preceding part of the forecast.

INTER, which indicates changes to occur frequently for period of less than 30 minutes in each instance.

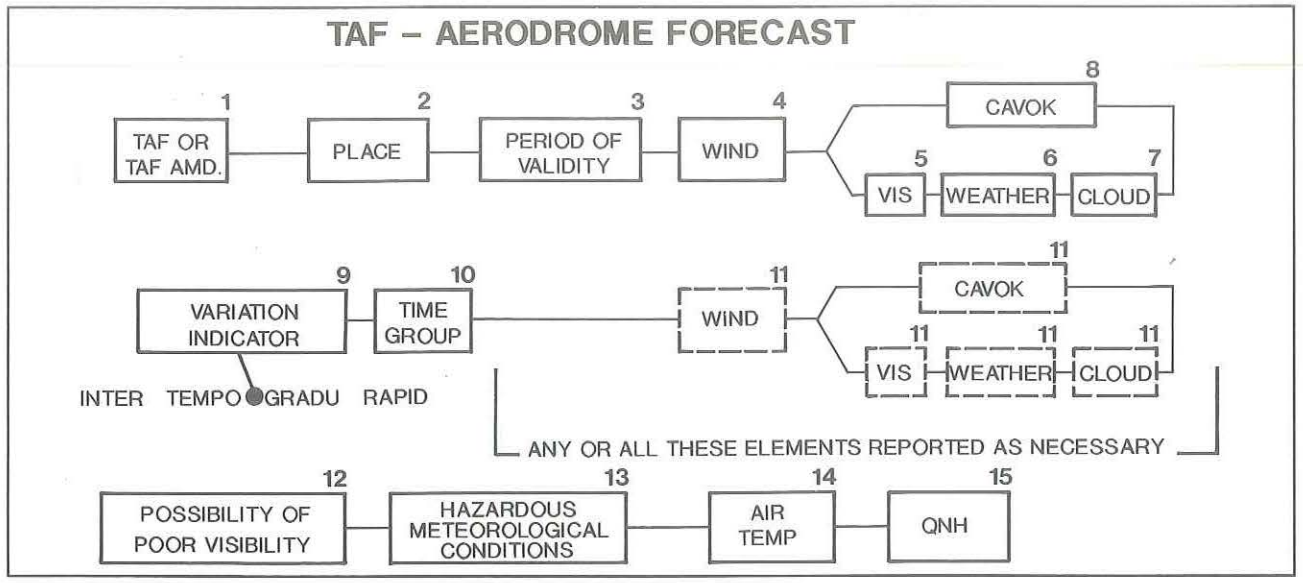
GRADU, which indicates a change forecast to take place at an approximately constant rate throughout the period.

RAPID, which indicates the change is forecast to take place during a period lasting less than 30 minutes.

These change and variation groups (TEMPO, INTER, GRADU, RAPID) are not introduced until all information necessary to describe the elements wind, visibility, weather and cloud have been given.

The information following the change or variation groups gives significant changes or variations in the elements wind direction and/or speed, visibility, weather and cloud. Reference to one or more of the elements is omitted when no significant change or variation is expected in the element concerned.

It is important to read the whole TAF, not just the INTER or TEMPO variation, as in fact the conditions in the body of the TAF may be worse than that indicated by the variation.



Time group

This is used to indicate the time period throughout which the change is expected to take place, the first two numbers indicating the commencement and the last two the end.

Details of the change groups

These are formatted in the same way as in the body of the TAF.

Possibility of poor visibility

When the occurrence of poor visibility, ie less than the alternate minimum, during any part of the forecast period is considered possible due to the occurrence of fog, mist or dust, but the PROBABILITY of such occurrence is assessed at 50 percent or less, the form PROB (percent) is used.

Hazardous meteorological conditions

Special reference is made in TAF to hazardous meteorological conditions which may endanger aircraft or adversely affect their safe operation. These conditions are:

- Moderate or severe icing.
- Moderate or severe turbulence, marked mountain waves.
- Severe line squall.
- Vertical wind shear.

Air temperature

Temperature information (in degrees Celsius) is given for certain aerodromes using two figures. Values below zero degrees are preceded by MS (minus).

QNH altimeter setting

QNH is given as a whole number of hectopascals.

Forecasts of air temperature and QNH are given at three hourly intervals for a maximum of nine hours. The forecast values relate to the commencement of the TAF validity, and subsequent three hour intervals. If you are planning to arrive at an aerodrome at a time between the time at which the values are given, then you should interpolate to find the value at your arrival time. On occasions when TAF are amended there may be a time indicated after the first temperature and QNH quoted — this refers to the forecast conditions at that time, and the subsequent temperatures and QNHs are for three hourly intervals from that time.

In conclusion, let us examine a TAF and see what it means:

TAF ASSY 1818 00000 CAVOK

GRADU 2301 34018/30KT 9999 3CU040

RAPID 0709 18020/35KT 9999 80RASH 3ST009 5CU20

INTER 0410 MAX 45KT 3000 95TS 5ST010 4CB040

23 24 28 33 1012 1013 1014 1002

This is a forecast for Sydney airport for the period 1800UTC to 1800UTC (24 hours). The forecast is for calm wind and CAVOK conditions initially.

Between the hours 2300UTC and 0100UTC the wind is forecast to become 340 degrees true at a mean speed of 18 knots with a maximum of 30 knots. Visibility will be 10km or more and there will be three eights of Cumulus at 4000ft.

Between the hours of 0700UTC and 0900UTC there will be a rapid change whereby the wind will change to 180 degrees true at a mean of 20 knots with a maximum of 35 knots. Visibility will be 10km or more. There will be rain showers with cloud of three eighths of Stratus at 900ft and five eighths of Cumulus at 2000ft.

There will be periods of less than 30 minutes between the hours of 0400UTC and 1000UTC when the wind will gust to 45 knots, the visibility will drop to 3000 metres and there will be thunderstorms; cloud will be five eighths of Stratus at 1000ft and four eighths Cumulonimbus at 4000ft.

The forecast temperature and QNH at 1800UTC is 23 degrees and 1012 hectopascals; the other temperatures and QNHs apply to the times 2100UTC, 2400UTC and 0300UTC.

There you have it. The TAF is the weather forecast for the indicated place and time period, formatted to tell you the forecast conditions with any changes of a temporary or lasting nature □

Don't tell anyone

Pilot contribution by Peter Little

THE DAY started well, the weather in Sydney was fine and beaut, a typically great winters day and the TAFs (Terminal Area Forecasts) that I obtained over the phone for my destinations of Glen Innes and Armidale, whilst not as good as I had expected, were easily legal and no alternates were required.

The weather man (i.e. Met. Officer) confirmed the earlier TAFs with little to add except that the weather was expected to improve as the day went on and he backed this up with the satelite pictures showing a front clearing to the North East and totally clear skies expected for the afternoon. I filed my IFR flight plan happy in the knowledge that whatever little weather there was would clear as the day progressed.

Having completed my pre-flight inspection I loaded my three passengers and departed Bankstown at 10.06 am local time planning to land at Glen Innes at 12 Noon and after some local inspections departing Glen Innes at 2.45 pm stopping at Armidale for fuel, and arriving back at Bankstown at 5.30 pm.

I climbed out of Sydney to 12 000 feet in my pressurised single engine aircraft on a 29 West Maitland 1 departure which took me to the 002 radial north and gave my passengers the most beautiful view of the Sydney Harbour, the City and North Sydney. As I reached my cruising altitude, now established on the 002 radial, I went to throttle back to cruise power only to discover I was already at cruise power. How did that happen? I instinctively checked all the other gauges and everything was in order except the cabin pressure which was showing 7000 feet when it should have been showing 6000 feet. Not enough difference to worry about. It had been nearly a month since I had flown, mainly due to bad weather at my intended destinations, and I concluded that I had inadvertently set cruise power for the climb instead of climb power.

Just the same I watched the gauges more than usual for the next 30 minutes but all remained normal. My attention was soon diverted by a large cloud mass north of the Hunter 8/8ths at around 6000 feet and an even larger mass in the distance rising to 15 000 to 20 000 ft. The forecast was for broken Strato Cu but there was nothing broken about this. I had enough fuel to get to Armidale and return to Bankstown with my reserves intact and since I was enjoying the flying I decided to push on and see what eventuated. I did take a look in the direction of Tamworth which looked doubtful but I knew Cessnock and Aero Pelican were clear.

Approaching Armidale, a few small breaks appeared in the cloud, although Armidale was completely covered. There was a large hole to the West with broken cloud beyond that, so I assumed that since the front was clearing to the North East Armidale would become clear later on. In front was different and I was faced with a wall of cloud up to 15 or 20 000 feet. I plunged on into the cloud noting the outside temperature was -4 degrees C, my aircraft is fitted with de-icing equipment but I prefer to avoid it if possible. I therefore commenced my decent into Glen Innes in dense cloud and later heavy rain and emerged below the cloud right on the lowest safe. I landed at Glen Innes in heavy rain but with ample visibility.

Whilst in Glen Innes the weather cleared a little but on returning to the airport it had once again closed in. Having completed my checks and engine run up (all of these were normal), I taxied out and commenced my ground roll after applying full throttle. I soon noticed that the manifold pressure gauge did not read full boost and in fact was indicating climb power only. All else was normal including the apparent acceleration so I presumed a faulty gauge. However, despite the fact that I was now at rotation speed, I aborted the takeoff. As there were no other aircraft in the area, I ran it up going the wrong way down the strip and could find no fault except the lack of full boost on manifold pressure. As I had found no lack of performance on my first takeoff attempt and there are no service organisations in Glen Innes, I decided to try a take off, conscious that I could easily abort if necessary.

Piper Malibu over St Hubert's Island, Brisbane Water.

The takeoff was normal but once in climb the rate of climb was barely 500 feet per minute and the MPG still showed climb power only at full throttle. I was so absorbed in watching the gauges I had climbed several thousand feet before I looked out the window and realised that I had forgotten to retract the undercarriage and flaps. Once this was done the climb speed became normal and I was now in thick cloud climbing to my cruise altitude to Armidale of 7500 ft. Now I noticed the MPG dropping as if the engine wasn't turbocharged and by the time I reached cruising had in fact dropped to cruise power with full throttle. Also the cabin pressure was 5000 ft instead of 3500 ft. I pondered on the probable cause deciding that the MPG was in fact working, so was it the turbo charge? Had I accidentally left one of the plugs in the air vents and blocked the air flow? I decided it was most likely the turbo charger and then became racked with doubt. Was it dangerous? Should I have taken off?

By now I was 10 minutes out of Armidale in thick cloud and about to descend to Area Minimum Altitude when Coffs Harbour announced that they had an amended TAF for Armidale which now required an alternate. I was told the Fokker had got in an hour ago so I decided to give it a go. Remembering the trip up I nominated Tamworth as an alternate and after some considerable delay was informed that Tamworth would be acceptable. My entire concentration was then taken up in the NDB approach and to my surprise broke visual right on the minima of 4500 ft. There was a nasty cross wind on the main strip and everything was soaking wet but the landing was uneventful.

Having refueled I checked to make sure none of the air vents were plugged. Without removing the covers, as I did not want to frighten my passengers, I inspected as much of the engine and turbo charger as possible but could find nothing wrong. I was pondering on what to do, whether to leave the aircraft in Armidale and have it seen to or to fly it back to Bankstown when one of my passengers, all of whom were unaware of any problem, came across to me and said 'Lets get out of here as quickly as possible, I'm freezing to death'. That was it, I loaded everyone and again found no indication of any fault during my checks and engine run up.

The takeoff was again normal and because I remembered this time to retract the gear, climb was also normal except that the manifold pressure kept dropping. By the time I reached cruising altitude of 11 000 ft, the manifold pressure was two inches below normal full throttle cruise. I checked the fuel flow which was normal and I had plenty of fuel, however the cabin pressure was low again at 7000 ft. We were now cruising above 8/8ths of cloud and having satisfied myself that all the gauges were OK and nothing was altering I began worrying had I done the right thing. What if the turbo charger seized? Was I taking an unnecessary risk? Was I risking my passengers? I looked around for emergency landing areas and calculated distances to airports gliding from 11000 ft. I noted holes in the cloud and above all watched the gauges.

I was somewhat relieved passing Singleton as the cloud was breaking up and I could see Cessnock and by the time I reached Parramatta I was in clear skies.

After landing, I refueled and put the aircraft away and an inspection by the engineers the next day revealed as I now expected, a clamp on one of the turbo charger hoses had come loose and once tightened the engine now boosted normally. I reflected on the number of flights where nothing goes wrong and that the actual weather is usually better than forecast and then on the number of varied events that had happened to me in one day but I couldn't tell anyone about it could I? I was pleased with my performance although I realised at times I was using all my concentration but don't tell anyone — might not get anyone to fly with me!!

Pressure. Single pilot IFR operations have enough built-in pressures without voluntarily adding to them. Well, that's easy to say! Part of those built in pressures are getting the job done — customer satisfaction. It is a most important pressure if you are to stay employed.

Then along comes a problem, the unplanned, uninvited extra pressure. In this case the extra pressure was applied very slowly through the turbo charger clamp. The pressure was at maximum before departure from Armidale — an obvious aircraft problem, lousy weather and the passengers giving the hurry-on.

What would you have done? Perhaps a phone call from Glen Innes may have solved the problem. Discussions with someone, particularly the boss, will share the pressure and help you to make the correct decision. Perhaps the passengers would not have been so keen to pressure a departure from Armidale if they had known of a problem.

This pilot did what many of us would do — push on. He shared the story of these pressures with us so that we might recognise extra pressures building against ourselves and take corrective action □

What goes up . . .!

OUTSIDE controlled airspace, when must you report your intention to change level?

1. Cruising at or above 5000ft.
2. Cruising below 5000ft and you intend to climb to 5000ft or above.
3. Having notified FS of a specific cruising level below 5000ft, you intend to change to another level or operate at non-specific levels below 5000ft.
4. Cruising non-quadrantal below 5000ft.
5. Cruising non-quadrantal above 5000ft in IMC.

We can all go to the references and dig out the answers. But, in flight these are some of the things we need to know 'off the top of our head'. Weather often forces an unplanned change in level and other considerations — a passenger request, for example — might also result in these changes.

But the real question is when *should* you report your intention to change levels? This puts it back onto you, the pilot, whose level of professional pride as a pilot should ensure a very high degree of sound airmanship.

The regulations require a report for each of one to three in the opening paragraph. Four and five are answered in one to three. If you are cruising non-quadrantal at 3000ft and have not told Flight Service your level, there is no legal requirement to advise a change of level remaining below 5000ft. The fifth situation is covered in the first; you are above 5000ft and must legally notify a change of level irrespective of IMC or VMC.

If we lay the legal side apart, however, and look at cruising levels and level changes from the good airmanship perspective, we might feel professionally pressured to report all levels and level changes. The hint is in item three; 'Having notified FS...'

OCTA B 5000 can mean to some pilots open slather. Obviously aircraft can be expected at any altitude in training areas and around airfields. But OCTA B 5000 should not be treated in the same way. After all, the only difference below 5000ft to above 5000ft is the larger volume of air traffic below 5000ft. Therefore, the more reason for flying at quadrantal levels and telling Flight Service of intention to change levels. Flight Service will then give you conflicting traffic about which the operator is aware. The more of us who report our level and request traffic for change of level, the more Flight Service can help us not to run into each other.

When OCTA below 5000ft there is no legal requirement to tell anyone what level you are at. Airmanship, professionalism, common sense even, but particularly safety demands you fly quadrantal whenever possible, tell Flight Service your altitude and advise before changing altitude.

What if the weather is a bit off putting? Of course if you intend VFR operations you must stay 500ft below the cloud and 1500ft above towns so you might have to try different altitudes. Tell Flight Service. 'For weather reasons, I will be operating between 2000ft and 4000ft', and tell Flight Service again when you select a new — hopefully, quadrantal — cruising level.

Its not only those below 5000ft who can be guilty of transgressing the laws of airmanship. RPT do it, too. One big jet flew right across Australia at the wrong level while another, again at the wrong level, had half a dozen Air Force jets pass in the opposite direction, same level, while all were in IMC.

Over a five month period in mid 1988, seven known incidents were recorded of IFR aircraft within 200 miles of Sydney changing level without informing Flight Service. This is alarming; it could be me who is killed by such unthinking behaviour. All the advise is to notify Flight Service two minutes before changing level. This gives Flight Service time to check other traffic for you.

We had to wait awhile for the maintenance people to build up some sand bags to land on. Just on the right side. That's the only skid that was gone. The skid? Well, you see there was this two and a half tonner that came over the crest of this hill the same time we did, but in the oppositie direction. No, we didn't report a midair. You couldn't have a midair with a truck, could you?

Extract from accident report

'No known traffic.' What do you think when you hear that from Flight Service? Do you put traffic out of your mind or do you wonder about that word 'known'? 'Known' rings alarm bells every time for me. Look what we have talked about so far and we haven't even considered those who don't say a word to Flight Service.

Two more real life examples may convince you to tell everyone what level you are cruising at and what level you intend to change to.

A twin commuter was cleared on the 062 degrees localiser to Sydney at 6000ft. This aircraft had a near miss with another twin, supposedly tracking from Bankstown to Deniliquin via Shelleys on climb to 8000ft OCTA. However, due to thunderstorms, the outbound aircraft diverted north-west of track and climbed to 6000ft, the lower level of the CTA, without advising Flight Service or requesting a clearance.

This example shows the hazards involved in operating near controlled areas and not being altitude aware. There have been recent incidents of aircraft straying out of the light aircraft lane into Bankstown from the north and getting perilously close to the big jets. Certainly, these examples include a large element of not being where you are supposed to be. But if you are not where you are supposed to be the chances are, especially in controlled airspace, you will not be at the correct altitude for your track and position. Those of you who operate near our busiest airports, do you know what the bottom limit of the CTA is and do you know why? The ILS glideslope to some runways can put some very big aircraft very close to the bottom of the CTA. If you think you have strayed into CTA, tell someone and keep your eyes open.

A final example covers the OCTA above 5000ft area, irrespective of VMC or IMC. A commuter was cruising non-quadrantal after departing Cowra for Sydney. A charter from Melbourne to Bathurst reported Cowra, cruising quadrantal and the same level as the commuter. A passenger in the commuter (which had 13 souls on board) pointed out the charter to the pilot. The aircraft passed very close.

The charter aircraft was at the right altitude but was 20 miles abeam Cowra, not overhead Cowra as reported. The commuter had advised FS cruising non-quadrantal. One pilot took a risk on the altitude; the other on position. Both these decisions were deliberate. The result was almost disastrous.

Perusing a list of occurrences involving change of altitude without notification provides some food for thought. Penetration of CTA is a regular with unfamiliarity with boundaries the most likely cause. This could result in a particularly nasty accident like the DC-9 and PA-28 over Los Angeles in 1986 (next ASD will have more on this accident).

Distractions while climbing or, even, in the cruise and inadvertently climbing add to the list of busted altitudes. Distractions may be caused by the weather — rain, cloud or turbulence or problems such as engine trouble and the demands of test flying or training.

Training. It is a distracting passtime. Not just for the instructor, too. The student pilot doing a solo in the local training area may well have his hands full while still gaining experience. How close do you fly to training areas? Its worth giving them a wide berth, both above and to the sides.

Other reasons given for changing altitude without notice include forgetting to say anything, misunderstanding a clearance and letting the passenger work the radio, resulting in misunderstanding between pilot and passenger.

The worst incident was a lie. The aircraft was involved in a parachute jump and the pilot reported operating below 5000ft. Another aircraft at 5500ft had to take evasive action to avoid the para jump aircraft.

Thorough preflight planning is really the answer to all this. It is very satisfying to have ATC accept your flight plan with no changes and for you to fly it as planned. I always urge the submission of a flight plan as it imposes professional discipline on the pilot, as it can be a satisfying extension of the flight and as it provides added safety. Not just safety because of full reporting, either, but also because of the preflight planning you must do.

Even if you do not intend going full reporting, spend some time on the charts becoming familiar with the different types of airspace you will be flying through or near, and the limits of that airspace. Plan your own altitude accordingly, noting where you must climb or descend, taking into account not only CTAs but also quadrantal levels and lanes of entry.

The planning stage must include the latest weather. The forecast can be spot-on, sometimes it is not, particularly area forecasts predicting cloud levels. If a VFR flight, you should plan a level clear of forecast cloud. If, in flight, the cloud does not live up to the forecast, you can always cruise at a different level.

Always talk to Flight Service. Tell them your level and, two minutes before you wish to change, ask them for traffic. That way Flight Service can prevent a nasty coming together.

And that's what altitude reporting is all about — not coming together. With the ever increasing number of flying objects in our skies, it takes only one pilot to ignore basic airmanship for the evening news to show pictures of two smoking holes in the ground ☐

Quiz Quiz Quiz

Flight plans

Within the CAA planning is well advanced toward the introduction of automated systems for the processing of flight plan information. The project is part of the Authority's commitment to reduce costs.

Since the introduction of the FDP compatible flight plan form, many errors have been noted that would not only prevent automatic processing, but could also contribute to air safety incidents.

To assist pilots in correcting these errors, a series of incorrect flight plans will be shown in successive *Aviation Safety Digests*, to challenge and test pilot ability to detect planning and operational errors.

Spot the mistakes in the plan below and check your results on page 13.

DEPARTMENT OF TRANSPORT AND COMMUNICATIONS

DOMESTIC FLIGHT PLAN FORM

Original (White) - Pilot
Duplicate (Yellow) - ATS

FPL — AIRCRAFT IDENTIFICATION: — CATEGORY: I (SP) V — TYPE OF OPERATION: RPT (CHTR) AWK PVT MIL MLJ — PRIORITY: SAR FFR MED VIP — PC: A — TYPE: C210 — Nr

COMMUNICATIONS: VHF (VR) VN — HF (HR) HN — UHF UR — NAVIGATION AIDS: 1 ILS 2 (L) LL — 1 ADF 2 F (FF) — 1 VOR 2 (O) OO — DME (X) D — RADAR W — TACAN T — 1 INS 2 I II — 1 OMEGA 2 M MM — DOPPLER P — OTHER — NIL N — SSR: (A) C NIL N

DEPARTURE POINT ETD — FLIGHT NUMBER—(REPEAT AS REQUIRED)— FINAL LANDING POINT: BK 0700 FL1 TBA BK

ATD: — END OF DAYLIGHT 1010 — AT LOCATION FL1

ROUTE SEGMENT/PFR	LSALT	FL or ALT	TAS	TR MAG	WIND	HDG MAG	GS	DIST	ETI	PLN EST	ATA	GS	EST next POS'N	Flt Proc, etc
SLS	3900	A100							32					
CM	7100	↘							45					
AWK									20					
TMB	7100	↗							35					
ES	6000	A100							19					
CFI	2200	"							19					
DL1	2000	"							16					
FL1	3500	"							16					
									202					
FL1														
DL1	3500	A090							20					
CFI	2000	"							16					
ES	2200	"							19					
TMB	6000	"							19					
CM	7100	"							35					
SLS	6400	"							45					
BIK	4800	"							13					
SY	4700	"							20					
BK	2000								4					
									191					
Altn														
Altn														
Altn														
Altn														

OTHER INFORMATION: CM NDB 20 MIN

FUEL CALC.	Min	L/Kg/	Min	L/Kg/
Climb				
Cruise	202		191	
Altn				
SUB TOTAL				
Variable Reserve	31		29	
Fixed Reserve	45		45	
Holding (if req'd)			15	
Taxi				
Fuel Req'd				
Margin (cruise rate)				
ENDURANCE	390		TBA	
FROM	BK - FL1		FL1 - BK	

CLIAS 120 / Mach

Operational Approval and Flight Plan Acceptance

Void

Approved/ Accepted

ATS

SARTIME / NOSAR — DATE TIME — FOR ARRIVAL AT — TO ATS UNIT — BY(method)

ELB(A) L X (LX) — FA LJ — SURVIVAL (LR) (ER) (WA) — OTHER(Specify) — POB 4/3

PHONE NUMBERS AT LANDING POINTS — CAPTAIN A. BAT — COMPANY F B KNIGHT AVIATION

DA 1641 (Rev 11/87) — Stock No. 16804.9

For over thirty years, the *Aviation Safety Digest* has been an integral part of Australian aviation.

In July 1986, responsibility for the *Digest* was transferred from the Bureau of Air Safety Investigation to the Flight Standards Division of the then Australian Department of Aviation (now CAA). This move reflected the perception that civil aviation may have reached the limit of accident prevention through regulation and that the way forward is through increased emphasis on safety education in general, and the 'human factor' in particular. Rather than just draw lessons from accident investigations, the *Digest* will increasingly seek to influence pilot behaviour by positive reinforcement of sound techniques. It will examine all aspects of piloting and publish formal results as well as 'the tricks of the trade'. The 'crash comic' will become a 'how not to crash' comic.

Anyone with an interest in aviation will benefit from tapping into this unique source of the accumulated wisdom of the profession and the latest research into aviation safety in Australia. Indeed, anyone with an interest in high technology and the roles and limitations of the human operator will find this publication enlightening.

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.

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Pilot Safety Awareness Seminars

These are conducted in association with the Aircraft Owners and Pilots Association. The program for the remainder of 1989 is as follows:

July 29	Perth
August 26	Dubbo
September 23	Rockhampton
October 21	Mount Gambier
November 25	Moorabbin

The above dates are provisional, and accurate at time of printing. Final dates, themes and venue details are published in the AOPA monthly Journal in the months preceding the event.

BASI contacts

24 hour contact numbers for BASI offices:

Canberra	(008) 02 0616 or (062) 57 4150
Adelaide	(08) 218 0579
Brisbane	(07) 835 3676
Melbourne	(03) 663 7015
Perth	(09) 378 1333
Sydney	(02) 281 3120

CAIR office contact (office hours)

Canberra	(008) 02 0505

Accident response

Bell 206B Jet Ranger II, 23 May 1987
Following a series of engine chip warning lights, the engine failed due to engine bearing failure. The helicopter autorotated into trees and was destroyed by fire.

BASI recommendation
The *Aviation Safety Digest* should publish an article stressing the importance of adhering to engine manufacturer's maintenance procedures.

CAA action
This accident will be the subject of an article which will stress the importance of following procedures.

Cessna 206U, 27 May 1988
In flight, the pilot discovered that throttle movement was restricted to 18 to 23 inches MAP. On advice of the company chief pilot, mixture was closed at 300 to 400 feet on finals to Kununurra. The aircraft then landed short and struck a ditch.

BASI recommendation
The *Aviation Safety Digest* should publish an article showing the correct and incorrect procedures used in this accident and the presentation of external advice to pilots who are under stress.

CAA action
The accident has lessons for us all and will be the subject of a future article.

Partenavia P68-B, 14 October 1988
The aircraft crashed while attempting to land at an 850 metre long ALA, illuminated by two vehicles' headlights. It was a moonless night and the ALA does not meet the requirements for night operations.

BASI recommendation
The *Aviation Safety Digest* should publish the requirements for night ALA operations and the dangers of night VFR flight.

CAA action
Although night VFR operations have been covered many times before, a short, descriptive article will be prepared as a guide for pilots.

Robinson R22-Beta, 2 November 1988
The pilot commenced mustering at about 5 am and flew for three hours. For the next seven hours he completed routine station duties in temperatures near 40 degrees C. After about 20 minutes into the second flight he decided to land for a drink of water. On landing, the tail rotor hit a small sapling, the assembly separated from the helicopter and the pilot landed after two revolutions.

BASI recommendation
The *Aviation Safety Digest* should remind pilots of the insidious effects of heat stress.

CAA action
The *Digest* regularly publishes articles on heat stress (e.g. *ASD* 110) and duty hours, including letters in Airflow. This topic will be revisited in the Summer edition.

AERONAUTICAL INFORMATION SERVICE AUSTRALIA

NOTICE

CURRENT DOCUMENTATION & PLANNED NEXT ISSUE

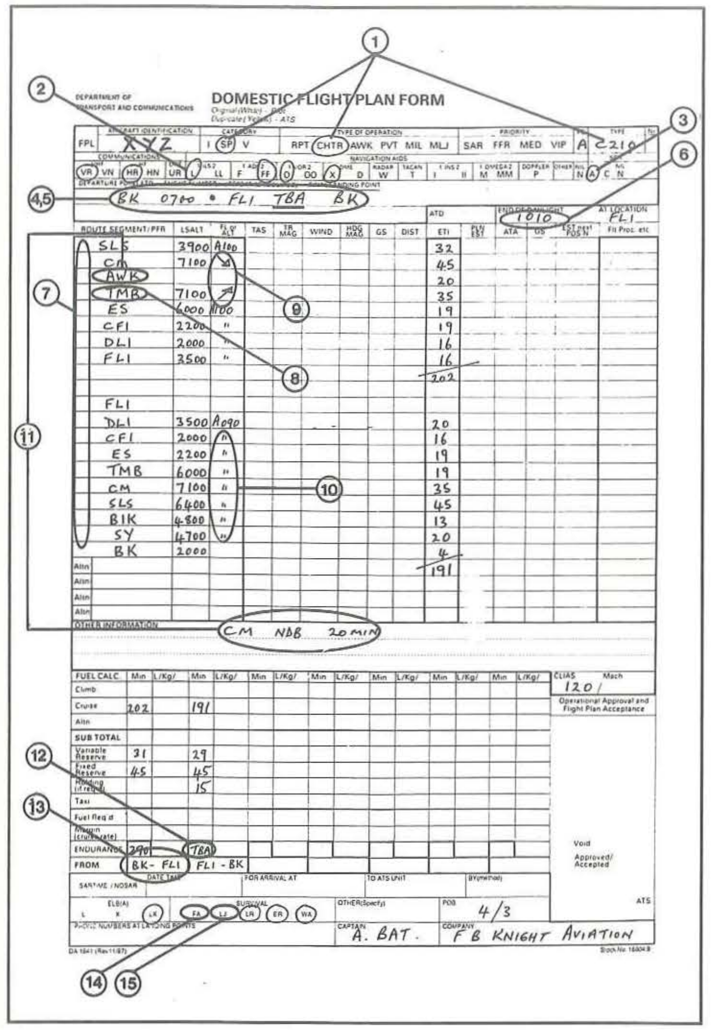
Document	Current Issue #	Planned Next Issue #
DAP(E)	29.06.89	24.08.89
DAP(W)	01.06.89	27.07.89
AGA 0-1-2	04.05.89	03.05.90
Aerodrome Diagrams	01.06.89	27.07.89
ERS A	04.05.89	24.08.89
AIP (book)	04.05 89	24.08.89
VFG (book)	04.05.89	24.08.89
AIP/MAP	29.06.89	14.12.89
VFG/MAP	29.06.89	14.12.89
DAH	29.06.89	14.12.89

dates quoted are effective dates

Note: CLASS I & CLASS II NOTAM ARE TO BE CONSULTED

WHEN USING ANY OF THE ABOVE DOCUMENTS

ISSUE: 6
DATE: 29 JUNE 89



1. IFR Category, passenger carrying charter operations using single engine aircraft are not permitted. (Rac/Ops-0-13 3.3.2)

2. When circling navigation aids do not encompass both the number and the letter. Only the letters are used in FDP.

3. Mode C SSR equipment is now required for operations within controlled airspace at Sydney. (Class 2 NOTAM CO 2/1988)

4. Pilot has not indicated an ETD for Flinders Island. Where an ETD is not accurately known, insert the earliest likely departure time. Failure to insert ETD will result in the flight plan being rejected by FDP. (Rac/Ops-1-21, VFG 44-8)

5. The departure point, ETDs and landing points are not correctly inserted. There should be no space between the departure/landing points and the ETD, and the departure point information is separated from landing point information by a dash; ie, ASBK0700-FLI0930-ASBK. (Rac/Ops-1-21, VFG 44-8)

6. The aircraft arrives at Flinders Island after last light. Lighting at Flinders Island is available for emergency use only. (ERSA)

7. Failure to nominate reporting points is probably the most common error detected by briefing officers. Reporting points are easy to forget when producing your flight plan, but are essential for Flight Data Processing. DO NOT use triangles.

8. 'TMB' is not an approved abbreviation. TAMBO is the correct abbreviation for Tambo Crossing. If you don't know the abbreviation, do not guess it, research it or write the location out in full.

9. There is no requirement to show climb or descent arrows.

10. There is no requirement to'DITTO' or to repeat the same information down columns; eg levels.

11. Navigation aid training Cooma (CM). The pilot should have inserted 'AREA' not 'AWK' in the Route/Segment/PFR section of the plan with NAT/CM NDB in the OTHER INFORMATION portion of the plan. (Rac/Ops-1-21 and Rac/Ops-1-22A, VFG 44-8 and VFG 44-11)

12. Fuel endurance is a must and TBA is not acceptable. If you don't know what your endurance will be from a location, calculate and insert a 'Fuel Req'd' figure.

13. When nominating an endurance from a location there is no need to show it as a 'FROM-TO' as shown; ie BK-FLI

14. There is a requirement for charter operators to carry first aid kits. (CAO 20.11 para 4.1)

15. There is a requirement for aircraft to carry life jackets on overwater flights and for each occupant of the aircraft to wear a life jacket during the flight over water. (Rac/Ops-1-49, CAO 20.11 para 5.1)

And how did you score?

Amendments to flight planning procedures were promulgated to the Aviation Industry in 1987 as AIC CO 17, and the flight plan forms currently in use are compatible with Flight Data Processing (FDP) equipment.

FDP equipment will automatically supply Air Traffic Service officers with the information necessary to provide services to aircraft, both within and outside controlled airspace.

Pilots have an important role to play, for when they complete their Flight Plan in the correct format, they ensure the plan's rapid processing by CAA staff.

Detailed instructions for the completion of flight plans are contained in AIP, VFG and as part of the flight plan pad □

Engine icing

Bureau of Meteorology

IN A RECENT edition of the Aviation Safety Digest, an article on airframe icing highlighted important aspects to consider in both flight planning and flight stages, to prepare a pilot for possible icing conditions.

Engine icing can be another form of aircraft icing. Like airframe icing, engine icing is a major cumulative hazard to flight operations. If left unchecked, it can choke the engine's induction system until sufficient power to maintain flight is no longer available.

Engine or carburettor icing can be a frequent hazard to piston engined aircraft. Fortunately, nearly all such aircraft have carburettor heaters to prevent this problem. There can be a 15 to 20 degree C temperature drop between the outside air intake to the coldest part of the carburettor. Carburettor icing can be avoided providing the pilot recognizes the conditions conducive to it.

The cooling effect of fuel vaporization together with the expansion of air as it goes through the carburettor can result in a large temperature drop sufficient enough to freeze the moisture in the incoming air. Of the two cooling processes, vaporization of fuel causes the greater temperature drop. Ice can form in the carburettor usually at small throttle openings around the butterfly opening and in the area where the fuel is mixed with the air.

Ice may form at any time of the year and under a wide range of atmospheric conditions, regardless of whether the aircraft is being flown in cloud, precipitation or clear air — provided that the incoming air has the proper moisture content and temperature.

If the relative humidity of the outside air being drawn into the carburettor is high, ice can form inside the carburettor with a temperature as high as 25 degree C. It is most serious when the temperature and the dewpoint approach 20 degree C.

The carburettor heater is an anti-icing device which preheats the air before it reaches the carburettor, melting any ice entering the intake and keeping the mixture above the freezing point. The heater is usually adequate to prevent icing, but will not always clear out ice which has already formed.

Therefore if engine icing is suspected with symptoms being rough running and loss of power, the pilot's immediate action should be to select full carburettor heat. The melting of ice inside the induction passages may initially result in the engine running rougher, but the temptation to return to cold air should be resisted and the hot air be allowed time to clear the ice.

Points to remember

These are some worthwhile points to remember concerning icing conditions in general:

— During your meteorological briefing, check for possible icing areas. Take the opportunity to check AIREPS in the area of your planned route.

— If your aircraft is not equipped with deicing or anti-icing equipment, avoid areas of known icing.

— Use your deicing and/or anti-icing equipment during situations of light icing; but when such equipment becomes less effective, immediately change altitude and/or course rapidly to take your aircraft clear of icing areas as soon as possible.

Remember that the meteorological briefer and other people on the ground have no way of observing actual icing conditions. Be considerate of your fellow pilots, file an AIREP if icing conditions are encountered □

DC3 in icing conditions.

Ice — yet another way to get you

by Ben Schiemer, Examiner of Airmen, Civil Aviation Authority

TRACK AND heading 093 to Noojee, lowest safe 6200: wild, beautiful tiger country below. A package of aviation history to fly, enough cloud to make flying interesting and a red-hot pot-bellied stove waiting in the crew-room at Sale. We could only feel guilty for collecting our pay.

But the C47 has no radar (can you imagine Indiana Jones needing radar?). Suddenly it was very dark except for the white stuff rushing in waves at us, and the throb of engines was overlaid by the slashing of cold rain and ice.

Turbulence no problem for such handsome dare-devil pilots, height holding O.K. Power reset for turbulence penetration speed. Jeez — look at that ice build-up on the windscreen: wing boots on cycle, heaters checked on, gills fully closed, carb air hot.

Carb air hot! The levers are stuck fast! Look at that build-up in the ram air intakes — it's blocking the rotation of the doors! Those bloody engines will die in a couple of minutes unless we can turn the doors to HOT!

I heaved at the carburettor air controls with increasing desperation, suddenly vividly aware of the great trees on the steep slopes in the cloud below. Fearful of breaking cables and connections, I rammed the levers back and forth to tear the intake doors free, my co-pilot watching the struggle with increasing anguish, the boost gauges edging down.

At last the air doors turned — first one, then the other. The big radials purred on. I learned about icing from that.

Most piston pilots know about carburettor icing, but it is natural to associate it with cold, wet conditions. Accident reports show some 18 identified (the evidence disappears) forced landings due to carburettor icing in the last four years. Many of the pilots involved may have been expecting carburettor ice but failed to use hot air properly (steady application of hot air at the right time, not whacking it on and off), others didn't remember that you can get carby ice at ambient temperatures up to 25 degrees C if the humidity is in a critical range.

My problem with the C47 was impact ice. Carburettor ice was not a serious problem because the PW1830 has an injector system that feeds fuel into the supercharger after the venturi and throttle butterfly. But the engine does need a lot of air and if the air intake is blocked by ice (or anything else) then the big donk will soon enough snuff it. And so will any other engine, fuel injected, turbocharged, or whatever. Impact icing will always occur when there is visible ice on the rest of the aircraft. On the C47 ice accretions could jam the air intake doors in the ram position, because they have to be rotated to go from Ram to Hot selection.

Designs differ of course. The Baron, for instance, has air intake through a filter fed by ram air. Should the air intake or filter become blocked a spring-loaded, normally closed door will open under suction to allow warm air from around the engine to get to where it's needed. Being thoughtful fellers, the Beech mob have provided a breakout cable and handle just in case a 'flash flood' of freezing water gets through the filter and welds the alternate door closed. All the pilot has to do is give the alternate air T-handle a firm tug to make sure the flapper door is free.

Don't confuse this manoeuvre with selection of carby heat on a carburettor engine! If you cycle from Cold to Hot and back to Cold too quickly a splash of hot air will be introduced to the venturi: the most likely result would be sufficient melting of ice to smooth it into a rock-hard base for further accumulations until the venturi looks like one of those arterial vein diagrams the medical doom-dooms use to get us old blokes off bacon-n-eggs. Roughly the same result.

Remember that snow and slushy sleet — cold crud — will stick in the intake under conditions where such would slide gracefully off the airframe, probably taking an aerial or two with it. This is obvious when you consider that primary air intakes are designed to collect, hold and direct air to the engine's gullet, be it injected or carburetted. The slushy stuff will tend to fill up your air intake/carburettor rather like the mud that accumulates in the wheel-wells of your Range-Rover, while it slides despairingly off the glistening exterior.

So look at the system on your particular aircraft: look at the machine, not just the handbooks, and talk to your favorite LAME about it. If nothing else it will get you aware of engine ice as a problem, leaving you less likely to forget about it when the thunderclaps are roaring. Remember that when the manufacturer writes about his machine he has a vested interest in minimising the warts. That's why you should look at the machine and talk to the LAME, to see what you could do if the chips go down.

That's all straight-forward enough. Or so it would seem. It seems so straight-forward that manufacturers, while putting carburettor icing procedures up front in the checklists, often mention intake icing for injected engines as something of an aside.

And it shows because pilots sweat out rough-running engines, drop into the bush, hills and gullies, and occasionally cream themselves because they didn't get around to selecting alternate air (they were probably too busy flying on one, calling May-Day, or selecting a soft spot, to go for alternate air).

So read your manual: it may tell you all about it. But if it doesn't, remember that the aircraft probably wasn't cleared for icing conditions and there may therefore be little mention of what you should do if you find yourself in it. Manufacturers have the privilege of expecting their products to be used as directed, but real life can find you suddenly projected into something they didn't cater for (they might have recommended an FA18). So if the manual doesn't say much about what to do if you suddenly ice up, pray that you've gleaned what you can . . . or just pray.

Carburretor icing

Carburettor icing can grab you like a brown bear when it's cold and dark and rainy. Or it can creep up on you on a clear midsummer's day. You must always cater for the possibility of carburettor ice. And it is not just a matter of using hot air any time you pull the throttle back; hot air used in hot dry conditions may boil off fuel in the carburettor and unbalance the mixture enough to cause rough running or engine failure. Or if you are descending on a cool day you may have to keep the speed down and the power up to get enough hot air to keep carburettor icing at bay.

Bone up on the owner's manual, seek advice from old hands, read all about it (the Manual of Met. Aviation Supplement, ASD 132, pilot licence theory texts; all have something to say). Above all make it second nature, priority one, to use carby heat correctly on a routine basis. That way you won't find yourself too busy to get around to carby heat one day, because you didn't get around to it.

Impact icing

If your aircraft hasn't been cleared for flight into icing conditions then you must try to stay away from it. Prop ice and resulting imbalance, frozen trims, higher stall speeds all occur, and many components may not cope with the ice loads and vibrations. The dying song of your (expensive) HF aerial may well alert you to an icing condition.

But if despite trying you do get caught out, then go for alternate air as priority one to ensure that induction icing doesn't make a hard life even more difficult, confusing, or impossible □

Forced landing after takeoff

MICHAEL Badge, in ASD 139, raised some questions on forced landings. Other articles, including Airflow, discuss early considerations in a forced landing. Here, we will look only at the engine failure in a single engine aircraft soon after takeoff. First a real-life example.

The flight was planned as a single circuit for a passenger joy ride. Runway 35 was used with the wind 310 at 5 knots. At about 100 feet and 90 knots after takeoff the engine lost nearly all power. Because he was just past the end of the strip, the pilot turned left with the aim of landing back on the strip.

Witness' description of the flight path indicated that the turn was almost completed when the aircraft stalled and descended steeply, right wing down, to ground impact. Both occupants received severe spinal injuries and the aircraft was badly damaged.

From early in the training sequence, pilots are taught not to attempt a turn back through 180 degrees. Obviously, with a large airfield a turn may require only 90 degrees. Such a maneouvre, however, needs to be thought out before the emergency.

With any wind, a turnback is even more hazardous. After the initial shock of engine failure, the typical wide-eyed pilot will be frantically looking outside for the best place to land. While in the air — even as a glider — the aircraft still has to be flown. During an emergency turnback, the eye will subconsciously detect an increased groundspeed as the turn continues from into wind to downwind. This will be interpreted as an increased airspeed — the conscious mind is still working on where to land — and result in back stick, reduced airspeed and, eventually, stall.

I was amazed to witness this process once when a small aircraft did an approved low pass. The pass was done downwind, with about 20 knots tail wind, but was planned to be as slow as possible so that observers on the ground could see the passengers. Why the pilot did the flypast downwind I never understood. However, his turn onto base for the second run was similar to a turn back following engine failure. The pilot was looking outside to align the aircraft for the next run and, about three quarters through the base turn, the aircraft stalled, crashed and burnt.

Before the takeoff, consider where to go if the engine does stop. The aim is to get as slow, without stalling, and as low as possible before hitting anything, if obstructions cannot be avoided. But you must stay in control. If the aircraft stalls, you no longer have control, you are along for the ride.

One important point should be made. If you fly a twin (or more than one engine), your options are much greater. Of course it is always possible that you have so overloaded the aircraft that, following an engine failure, you are forced to land straight ahead anyway. Assuming, however, that you have checked the aircraft performance data you should be able to complete a single engine circuit. An option always is some type of procedure turn for landing in the opposite direction but that is more likely to cause more problems than the familiar circuit. This point is important simply because some people who have recently upgraded to twins or who fly both single and twin engine aircraft do forget about the second engine following an engine failure and give themselves an unnecessary forced landing.

To finish, lets hear from a pilot who walked away from an engine failure soon after takeoff.

Dear Sir,

Like Michael Badge, I have tried to keep my forced landing procedures and skills up to the mark with frequent practice and check flights with instructors.

But when I recently experienced a REAL forced landing, there was little opportunity to put my training into actual practice.

You see it all happened *below* 300ft, and yet all my training has been above this altitude.

When the engine of my Cherokee 140 decided to internally self-destruct on takeoff at about 250ft, I had just crossed the upwind threshold. My immediate thought was, 'Can I get back to the field? No! There's the beach, that'll do me!'.

My instructors have always maintained that at low altitude it's impossible to return to the field, but I'm really not so sure. But it's not a situation I can readily repeat just to find out.

After my experience, I can assure your readers that a REAL engine failure is very different from a simulated one with an instructor sitting alongside.

Firstly, the noise and the fumes. A conrod thrashing around inside the crankcase made an enormous din and that effected my ability to think clearly. Oil fumes too, made me fearful of fire.

Did I close the throttle? Yes, at least it was quieter and the engine had lost most of its power. Carby heat and F-MOST checks are not much use when the engine is destroying itself. May Day? Not a chance, and anyhow I was still on the ALA frequency. Turn off switches and mains? Did not give it a thought until on the ground. Unlatch the door? No!

I only had time to tighten my seat belt, crank on three stages of flap, slow the aircraft down and settle onto the beach. I estimate there was only 30-40 seconds between engine failure and touchdown.

I was very, very lucky not only to survive but to have a relatively un-damaged aircraft. (Unfortunately some further damage was sustained in recovering the aircraft from the beach.)

It's a situation I certainly do not want to repeat, but it's also a situation that I wish could be practiced in safety.

Yours faithfully,

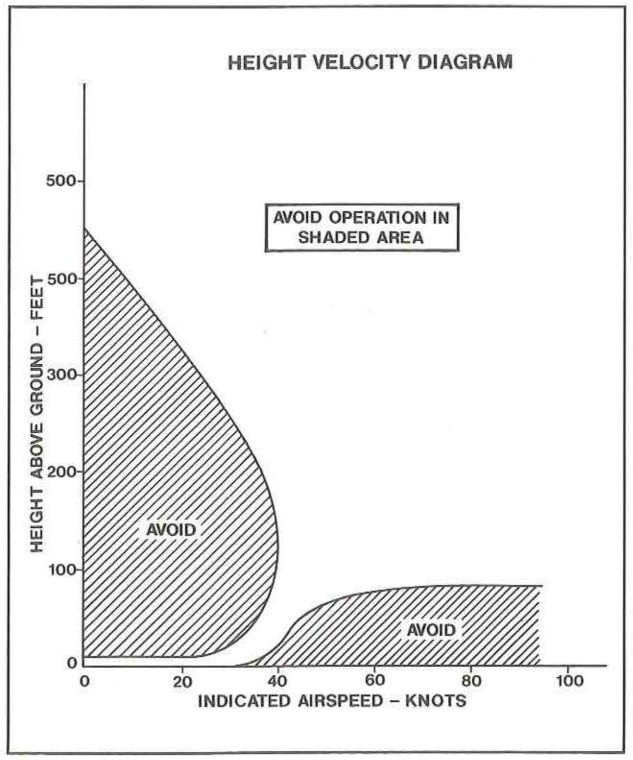
Chris Wilson □

Enter at own risk

by Keith Engelsman

A NOT UNCOMMON sign at the entrance to properties generally indicating the presence of savage dogs, billy goats and other semi-domesticated animals likely to present a risk to life and limb. These signs are provided as a friendly warning that you should either stay out or, if you choose to continue, be aware of a potential danger.

All helicopter flight manuals contain a similar warning. It is called by many names: Limiting height-speed envelope; Avoid area; and Dead man's curve are just a few. The generally accepted term is Height-velocity (HV) diagram which, in itself, does not suggest anything hazardous. The fine print that accompanies the HV diagram is normally a mild admonition to 'avoid operation in the shaded area'. A typical HV diagram is at Figure 1.



A casual study of the diagram does not indicate the potential dangers of ignoring the advice given. After all it is only *advisory* hence its usual placement in the Performance section of the flight manual. For some types the diagram appears in the Limitations section; but this is not strictly correct as it is not a limitation on, or prohibited area of, operations.

The following discourse is intended to briefly sumarise the requirements for HV diagrams, the way they are developed and the potential for disaster of not only venturing into but, in some circumstances, straying too close to boundaries.

Manufacturers do not produce HV diagrams out of the goodness of their hearts. The suggestion that their latest and greatest machine might have some flight regimes that are less than perfect does not accord with the glossy brochure. HV diagrams are produced because they are a certification requirement. The actual regulation states inter alia 'If there is any combination of height and forward speed (including hover) under which a safe landing cannot be made under the applicable power failure condition ... a limiting height-speed envelope must be established (including all pertinent information)for that condition . . .'

The applicable power condition referred to means complete and sudden power loss on one engine and the remaining engine(s), if you have any, operating at maximum power. The regulation also requires the envelope to cover all weights up to MTOW at altitudes up to at least 7000 ft.

HV diagram development is a very high risk, and expensive operation. The manufacturer will wish to produce the smallest avoid area possible which in turn will require flight to the very edge of the safe landing envelope. Unsafe landing will, by definition, result in some damage to the aircraft; and possibly the crew and passengers. For these reasons, HV testing is normally left until the end of the certification programme, the oldest development aircraft is used and there is a certain amount of 'short straw drawing' in the test pilots office.

Before commencing HV testing, the test pilot will become totally familiar with the autorotational characteristics of the aircraft. This will include rotor decay rates, handling qualities during transition from powered to autorotative flight, optimum flare heights, attitudes and rates. The test aircraft will be instrumented to record critical parameters, notably vertical and longitudinal accelerations, and loaded to the correct weight. Supporting personnel, including fire and rescue services, will be briefed on their part in the tests. The test area will be surveyed to choose sites for ground recording equipment and cameras. The cameras are important for data recording purposes and occasionally provide some sobering records of what happens when you step over the line.

The flying to develop the HV diagram will involve dozens, and even hundreds, of data points. The aircraft will be flown to its absolute limits, with respect to vertical and horizontal accelerations, in an attempt to establish the smallest possible 'unsafe' areas. Occasionally limits will be exceeded and there will be a pause in the programme whilst the aircraft is repaired; or replaced.

At the end of the programme the certification authority will require the manufacturer to prove the HV diagram. This process involves spot checks of certain points along the edge of the avoid areas. It is carried out by an experienced test pilot after a comprehensive familiarisation with the aircraft and its autorotational characteristics.

The net result, as shown in the flight manual is the product of extensive testing and checking but what does it mean for the average helicopter pilot?

First and foremost is the fact that if you have an engine failure whilst operating in the avoid area you will damage the aircraft in the ensuing landing. The extent of damage will depend on how far over the line you are and may result in injury to you and your passengers. For example engine failure during a high hover taxi ('high' means greater than five feet in most machines) will damage the undercarriage but hopefully not much else; always assuming you eliminate yaw and drift before touchdown. More dramatic is an engine failure whilst hovering at say 100 feet. A high speed run across your mates property with the skids in the wheat may be exhilarating but if the engine stops you will be lucky if all that results is a wrecked tail rotor as you try to flare off ground speed; that's if you get a chance to flare before impact.

Another feature of HV diagrams is that, unlike other performance data in your flight manual, there is no buffer or margin for error. They have been developed by someone who is probably the best pilot in that particular machine. Your chances of doing better are about the same as winning Lotto. Hence, in all probability, an engine failure in the 'safe' area, but close to the line, will result in a crash. This has been proven on several occasions by overzealous instructors seeking a more demanding emergency simulation for their students.

At the end of the day there are a few simple rules for dealing with the HV diagram.

Rule 1

If at all possible, ***don't fly in the avoid areas*** :- keep your hover and air taxi height as low as possible (three to four feet is normally ample); is it really necessary to hover at 200 feet to take that picture? (Could you go higher or put on 30 knots?). Avoid low passes as they allow no room for error.

Rule 2

Don't take liberties with avoid area boundaries: you would be amazed if you knew how little margin there is before the bottom drops out of your world. Your insurance company will not thank you for failed attempts to advance this area of aviation research.

Rule 3

If you must operate in the avoid area, give yourself the best chance of minimising injury in the event of an engine failure :- seat in good condition to absorb impact forces?; harness tight and secure?;how about a helmet on your next sling load job?

To conclude, a few facts about commonly held beliefs from HV diagrams.

'It only applies to maximum weight operations' — Not so. Some parts of the avoid areas are defined by pilot reaction irrespective of weight. The problem is you don't know where they are and what margin, if any, exists for reduced vertical velocities at lighter weights in other areas. See Rule 2 before contemplating researching this aspect.

'High hovers and air-taxi are safe in strongish wind' — Only true in very strong (greater than 40 knots in the above diagram) winds and even then there is a complication. Remember the HV diagram relates to IAS, but when the engine stops at say 100 feet and 40 KIAS, *ground* speed becomes a major consideration. Construction of the HV diagram involved use of flare effects wherever possible. If airspeed equals windspeed then that flare effect is not available — unless you wish to touchdown going backwards. Think about this circumstance next time you fly in strong winds and give yourself an extra margin beyond the avoid area limits.

'The high hover limit point (450 feet in the above diagram) is the minimum height I should fly downwind' — Not so. The HV diagram only holds true for a landing in the direction of flight following power failure. Minimum recommended downwind height is dictated by the autorotational performance and handling of the particular aircraft type. There is no direct correlation between the two issues.

In summary, the HV diagram has been provided to warn you of a potential danger. If you must operate in it, eg. sling load operations, then give yourself the best chance of surviving the ***inevitable*** crash landing if the engine stops. If you don't have to enter the avoid area then don't; believe me, you don't need that sort of thrill □

NIL DEFECTS

Aviating with Mogas

FOR THOSE aeroplane owners and/or operators who wish to use MOGAS in their aeroplane the following may be of interest:

Petersen Aviation Inc. is an American firm which is the current holder of a large number of U.S. supplemental type certificates (STCs) covering the use of MOGAS in many piston engine aircraft.

Recently Dr. Ray Hodges acting as the Australian agent for Petersen Aviation, applied to the CAA (Australia) for Australian acceptance of those STCs which cover the use of MOGAS in the following aeroplanes:

Make	Model
Air Tractor	AT-300, AT-301
Ayres	S-2C and 600 S-2C, Serial Nos 1163C & 600-1163C thru 1526C or 600-1526C only
Ayres	S-2R, S2R-R1320, 600 S2D
Ayres	600-S2D, S-2R, S2R-R1340
Bellanca	7GCAA, 7GCBC, 7AC, S7AC, 7BCM, 7CCM, 7DC, S7DC, S7CCM, 7EC, S7EC, 7FC, 7GC, 7HC, 7GCA, 7JC, 7GCB, 7KC, 7GCBA and 7ECA
Boeing	75(PT-13), A75(PT-13A, 13B, 13C), B75(N2S-2), E75(PT-13D, NS2-5, PT-13D/N2S-5), A75J1(PT-18), A75L300
Cessna	150, 150A thru 150M, A150K, A150L, A150M, 152 and A152
Cessna	170A and 170B
Cessna	172, 172A-M
Cessna	175, 175A, 175B, 175C, P172D
Cessna	177
Cessna	180, 180A-H and 180J
Cessna	182, 182A-H, 182J-N and 182P (with Continental 0-470R or 0-470S installed)
Cessna	188, 188A, 188B
de Havilland	DHC-2MkI Beaver
Maule	M-4, M-4C, M-4S, M-4T
North American	BC-1A, AT-6 (SNJ-2), AT-6A(SNJ-3), AT-6B, AT-6C(SNJ-4), AT-6D (SNJ-5), AT-6F(SNJ-6), SNJ-7 and T-6G
Piper	J4E (L-4E)
Piper	Normal category PA-18 '150', PA-18A '150', PA-18S '150', PA-18AS '150'
Piper	PA-18A '150' restricted category
Piper	PA-20, PA-20S, PA-20 '115', PA-20S '115', PA-20 '135' and PA-20S '135' with Lyc 150 hp engines
Piper	PA-22, PA-22-108, PA-22-135, PA-22S-135, PA-22-150 and PA-22S-150
Piper	PA-28-140, PA28-150 PA-28-151
Piper	PA-28-235
Piper	PA-23

If your aircraft is one of the above types and you wish to use MOGAS please contact Dr. Hodges at the following address:

Dr. R. Hodges
(Churchill Heights)
RMB 4333 Rickards Drive
MORWELL VIC 3840

Alternatively you may wish to phone him on business hours (051) 22-0200 or after hours on (051) 22-1845.

Please note that approval to use MOGAS in a particular aeroplane will only be valid whilst it is being used in the private or aerial work category and whilst it remains under the control of the applicant for the supplement. New applications are required upon change of ownership.

The Gippsland Institute of Technology is also the current holder of an Australian STC number 146-1 for the use of MOGAS in Beech A23-19 aeroplanes. Dr. Hodges is also the relevant contact for anyone interested in the above Australian STC.

If you are interested in further reading on the use of MOGAS in aircraft, the following Airworthiness Advisory Circular (AAC) articles are available through your local Airworthiness Office:

AAC 152-1 Use of MOGAS in certain light aircraft,

AAC 191-2 Use of MOGAS in certain Cessna aeroplanes, and

AAC 195-2 MOGAS correction □

NIL DEFECTS

Replacement parts

IN 1987, a Bell 47G2 helicopter crashed in Canada. It was found that the steel core of the wooden blade had failed at a butt weld 28cm from the tip. The blades were Hiller 12 blades which had been extended to suit the Bell 47. The modification is not approved by the manufacturer nor is it authorised. A further 11 bogus blades have since been found by the Canadians.

Such a weld can only be found by x-ray inspection. The bogus modification is done in such a way that it cannot be detected visually.

Two years earlier an Australian operator sent his Bell 47 blades to the United States for overhaul. The blades were correctly marked as being manufactured by Bell. However, the overhaul facility reported the blades were in fact Hiller blades which had been supplied by a company in Torence, California.

Despite the best efforts of the CAA's Continuing Airworthiness Section, the FAA advised that they were not able to take any action against the company because the relevant records were no longer available. The lesson for Australian operators is to have your blades checked and be sure of the facilities you use for overhaul and source of replacement parts.

The problem of bogus parts extends well beyond Bell 47 helicopters. But bogus parts are one side of the problem: the other side is improperly or poorly overhauled replacement parts.

Both the cost of replacement parts and difficulty in obtaining them puts the pressure on to use second hand parts. This is okay if the part has been properly qualified and if it is the correct part for your needs. But, increasingly, both these conditions are not met. Don't assume that this is an overseas problem, it is already here.

There are overseas companies which buy up large amounts of used aircraft and aircraft parts and sell them in 'as new' condition with the full life of the original article. Some of these companies do no more than clean the part to make it look good. The worst companies will change identification markings and sell the part as genuine — the bogus part.

As we saw in the Bell accident, bogus parts can kill. So can second-hand replacement parts sold as new. The best protection for you is to use only genuine parts. If you are confident of the source of replacement parts, then certainly do use them. If you have doubts, seek advice from the aircraft agents or the CAA □

AIRFLOW

Dear Sir,

I have just read with interest the latest *Aviation Safety Digest No. 139* and in particular the correspondence from Michael Badge in the 'Airflow' section. Having just successfully walked away from my first forced landing in 13 years of flying, I would like to relate my experiences for my fellow readers, and especially Michael.

Though the crucial phase of the forced landing (that is, the landing itself) cannot be carried out whilst simulating an engine failure during instruction, I believe pilots can do a lot to prepare themselves for the day when the real thing may occur.

Here are a few practical suggestions to help prepare for the day when that reassuring 'purr' up front is replaced by a deathly silence. Bearing in mind that a forced landing can occur at any phase in the flight, keep a constant lookout for suitable areas upon which to land, should the unexpected occur. Watch for any wind indicators, such as smoke, dust, windmills etc, and update the information in your mind as often as you can during the flight.

Remember that most light aircraft do not need a runway the length of Sydney airport to safely put down on. We are fortunate that the greater part of Australia is relatively open farming land, and even an area that looks the size of a pocket handkerchief from 5000ft can be plenty big enough to put down on and walk away from. If over a built up area, a golf fairway or a larger sporting oval is better than a suburban street.

Whilst flying, especially over farming country, I often indulge in a little mental exercise which for want of a better name could be called 'spot the power line'. Such things could obviously cause a major hangup if one were to get tangled up in them in the stages of a forced landing. Most farm homesteads and sheds etc. have powerlines in the vicinity, so make a mental note of where they are so as to avoid them should a forced landing take place.

Over the years I have also made a practice of simulating forced landings whilst in the circuit area. For example, as you turn base, cut the power right back and experiment with different flap settings to adjust the rate of descent. Aim for an overshoot on long final with no flaps, then gradually apply flaps as the field gets closer. Try not to use the power (unless you have to, of course) because when the real thing happens there *is* no power up front. Your glide rate will be determined by the amount of wind, the amount of height, the amount of forward speed and the amount of flap. Spot landing competitions are not only fun to participate in, they can be very helpful for honing your skills in this area.

Whilst I do not pretend to be an authority on forced landings, I recently walked away from my first one in 300 hours of Private Flying. Whilst flying an Auster J5G Autocar from Wongan Hills to Bencubbin (W.A.), distance about 65nm, and cruising at 2000ft agl just after sunrise, number four conrod broke in half and proceeded to demolish crankcase, front engine mounts and cowling. The windscreen immediately blotted out with oil, so forward visibility was impossible. I was about 5nm north of Koorda at the time, and as my height would not have permitted me to make the local town airstrip, I elected to land in a paddock close to a farm house just to the left of my flight path. The wind was coming from the east, so having shut the motor off, I commenced a lazy spiral descending turn to the west which brought me to the western side of the paddock I had elected to land in. A quick check revealed that the powerlines branched off to the south and east of the house, so I hoped there were no more in the area.

Forward visibility was out of the question, with an oil splattered windscreen and landing right into the rising sun. The wind was a little stronger than I had anticipated so I elected to land flapless so as to make sure that I made it over the top of some tall gum trees. The landing was uneventful, though I found on a subsequent ground inspection that the paddock was liberally littered with many small heaps of rocks. Fortunately the landing took place without collecting any of these.

I was very thankful for the many hours of simulated forced landing training I received whilst gaining my licence. In the pressure of the moment it is marvelous how it all comes back to you. One final tip which one of my instructors impressed upon us in our training — 'if you are going to hit any fence, make sure it is the last one, not the first one'. In other words, if it is impossible to land without hitting something in the process, make sure you have got rid of as much speed as possible before you do so. Try to take the impact on the wings, in the case of a tree or powerpole etc., rather than with the passenger compartment. Brake heavily, ground loop if necessary. And remember that any forced landing which you can walk away from is a good one!!'

Hoping this article may be of some use in the next *Digest*. Yours in pursuit of Air Safety

Cliff York

Hopefully to inspire some 'crew room' type discussion I have included some thoughts I and others in my crew have had over many years on forced landings. I will welcome useful suggestions.

AIRFLOW

If you must land in tall trees, try to get below the foliage and have the wings take the impact on the trunks close to ground level. If this cannot be done, then use full flap, get as slow as possible without stalling, level the aircraft and gently let it down onto the tree tops. The chances are still high the aircraft will fall nose first and kill you, but those chances are less than stalling into the trees. Every accident I attended where the aircraft had stalled just before hitting the trees has been a fatal accident.

Ditching is a particular problem as the swells are at right angles to the wind. I decided I would always land along the swell line, even in a very strong wind. To land into wind means nose first into a wall of water unless you manage to put down just after a crest. It is important, again, to be as slow as possible, to adopt a flat attitude and to keep control of the aircraft — don't stall. Some people advocate a slight nose high attitude. I think that as the water gets closer you will inadvertently apply some backstick anyway. The danger is in touching the tail first and slamming the nose down so that it digs under.

With both landings in trees and in the water, the wheels should be up, if you have that alternative. Wheels down gives more opportunity to turn the aircraft over. Keep the aircraft under control; don't stall and keep the wingtips clear as long as possible. Finally, if at all possible, use available engine power. If fuel starvation is imminent and you are miles from land, ditch while you still have engine assistance.

Dear Sir,

The letter from Michael Badge in *Digest* number 139, bemoaning the lack of actual landings in 'forced landing' practice, is becoming a very old complaint. Fortunately there is a partial answer to the problem.

Many Flying Clubs and Aero Clubs throughout the country have regular competitions, and a common competition is a 'forced landing'* TO A FULL STOP. This is completed on a runway, and although it does not involve landing on trees or water it is nevertheless useful in building confidence for the real situation.

Anyone worried about this factor of training is urged to find a nearby Club which has regular competitions, and gain some practice below the 300ft minimum.

Yours faithfully,

Lawrie Debnam
President
Cessna Flying Club Inc.

* The 'forced landing' is conducted as a glide approach from overhead the runway at 2500ft agl.

A note on anonymous contributions. *The* Digest *welcomes any item which will enhance safety, including anonymous. Items which do not have a safety overtone will not be used. A recent anonymous letter was very critical of the Digest, air traffic services and the CAA.*

Any safety message this letter might have contained was negated in the revelation of the writer's abysmal piloting abilities. He was 'not unduly concerned' when he missed a turning point by 'a mammoth 100 miles' and descended low enough to read a town name on the railway station. Twice in his short letter he talks of nearly running out of fuel, once losing an engine until he sorted out which tank was full and which empty and once landing on an ALA in the dark with emergency lights and insufficient fuel to reach the planned destination.

I mention this letter for two reasons. If you wish to remain anonymous, we will respect that wish and will still use your contribution if it contains a safety message.

The second reason is most important — it goes to the heart of safety. The regulations under which we fly are there for our safety — pilots, passengers and those on the ground. They are not there to restrict the rights of competent pilots to fly.

No doubt there are other pilots with the attitude of our anonymous. Your attitude is unprofessional and frightening to the responsible pilot. You must get your act together before your act gets you.