FLY ABOUT

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FROM THE PRESIDENT

February, 2006

UNACCEPTABLE BEHAVIOUR May I extend my thanks to the many members who have supported my contention that violence has no place in the conduct of Northam Aero Club affairs. Since the incident at the January committee meeting Brian Whittington has resigned from the Club, as has David Bell. I regret Dave's decision because he has been a good member and solid contributor; however, I respect his right to do so.

As far as I am concerned this episode is now behind us, though it has been brought to my attention that a disaffected former member has tried to rewrite history by distributing misinformation via email to some members. I intend to ignore any such communication. I look forward to working with the overwhelming majority of our membership who believe in a civil society and whose attitude to the Club, and flying, is positive. It will be a pleasure to enter the Club rooms for a Committee meeting free of the feeling that I am walking into a combat zone.

PARTY SATURDAY, MARCH 4 Following the success of our Christmas lunch, it was suggested at our February committee meeting that we should have another social get-together. Accordingly, everyone is invited to a barbecue at the Clubhouse on the evening of Saturday, March 4, commencing at 6 pm. Please bring along your own meat – we will provide the salads and bread. I'll look forward to seeing you there.

NEW LIFE FOR CHARLIE Pearce Flying Club have approached us to cross-hire CMP to them for a two-month trial. As you know, our utilization has been poor over the past year or so and the Committee sees this as an opportunity to get some hours up and reduce the hourly component of our major costs. The plan is for Charlie to be based at the Pearce Club's headquarters at Gingin. They will operate it on a dry-hire basis. The Committee agreed with this arrangement at its February meeting, with a commitment to review it in two months. Thanks to Dave Rose, our immediate past president, who is a member at Pearce and saw the opportunity for what hopefully will be of benefit to both clubs.

COMMITTEE APPOINTMENTS At our Committee meeting on February 12 we discussed the appointment of committee members, as allowed under the Club Constitution, in the light of recent resignations. It was decided to delay the subject until the next meeting so that members who wish to submit themselves for appointment to make contact with the Committee. Please feel free to approach any of us if you would like to serve on the Committee until the next elections, due in July.

MASTER PLAN I have received a message from Andrew Forte regarding the Master Plan for the future of Northam Airfield which reads, in part:

“Please update your members that I have made a commitment for the delivery of the Draft Master Plan for Northam Airfield by 28 February 2006. Now that I am in receipt of the feature survey (Paul Kraft 25/01/06) with base aerodrome information that details its current status it is possible to overlay with development structure proposals. This was vital for the visual presentation of the airside and landside development concepts that are now under preparation.

“For member information I had a meeting with Robert Hutchison and Aiton Sheppard to gain the Town of Northam’s view on development and management on 5 December 2005. I am gratefully in receipt of comprehensive written submissions from the following persons: Graeme King, Scott Powell, Tony Rees, Claude Meunier, Allan Hayes, Dave Rose, Robyn Stewart.”

So it’s happening, though the wheels do grind painfully slow. When the report is submitted, we will meet with the Town and Shire councils to discuss the various recommendations, and report back to you.

RUNWAY SEALING The saga continues. The Department of Planning and Infrastructure and the CEO of Northam Town Council have apparently decided, without reference to us, to delay work on the runway until the Master Plan is finished. There is absolutely no justification for this added delay and I am seeking a meeting as soon as possible with Don Burnett.

SPECIAL THANKS To Errol Croft and Matt Bignell for fixing the toilet leach drain. Well done!

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WHAT IS AN ULTRALIGHT?

By Steve Vette*

An ultralight is a lightweight aircraft made in many shapes and forms; it comes in various sizes. It is built from many different materials and some have exotic enhancements built into them and are a delight to fly and handle. They can also come with some headaches and problems that can take some sorting out.

The early stages. Early ultralights were built by the “handyman” with very limited knowledge about aeroplanes, but with plenty of hand skills to make a machine that looks like an aeroplane. They were usually put together on a low budget in a shed or garage.

Builders were allowed to experiment with those machines in an open paddock but were not allowed to go higher than 500 ft above the ground. They were also not allowed to cross over any road or fly over houses. If they wanted to fly further out, they needed the written permission of the various landholders or owners of the terrain they wanted to traverse. There were a lot of hobby builders who had no flying training and were teaching themselves to fly. Most of those machines were single-seat aircraft and had minimal instrumentation. They were also bound by strict weight limitations that restricted the size of the engines they could use. Mostly two-stroke engines were used to power their machines and a prop was carved out of some good-looking piece of timber.

Due to the fact that no formal training for those minimal aircraft was available, many intrepid aviators came to grief and some paid the ultimate price. You do not get a lot of time to recover from pilot-induced error at or below 500 ft. Talk about re-inventing the wheel.

However the enticement to fly ultralights continued to grow and more people became interested by this adventure sport. They continued to build and kill themselves until CASA stepped in and decided that the accident rate was too high. Ultralights had a bad name.

The development. A group of interested people were contacted by the Authority and asked to form a group to address some of the problems and see if there was some way to overcome the continued trend of fatalities in this adventure sport and some form of licensing. This was the birth of the Australian Ultralight Federation (AUF).

The AUF came up with some rules, including weight limitations, certification criteria, a basic operations manual and a maintenance manual (both have seen a number of updates and upgrades since their inception). These were presented to the Authority, which allowed the AUF work as a self-regulating body under dispensation. A dual-seat category was established, which enabled all those intrepid, but unskilled, aviators to get some lessons. The next step was to get manufacturers to come up with aircraft built to the ultralight standards and get approval from the Authority. These moves led to the introduction of some of the certified aircraft you see today.

The building of certified aircraft. Some manufacturers decided to start from scratch and design new aircraft using approved aircraft grade materials and building practices, including chubby high-lift wings and propellers made to a standard. This enhanced the machines no end, making them safer all round. The world was searched for suitable lightweight engines that would perform well and were easy to maintain and service. The stalling speed also came under scrutiny and certain criteria had to be adhered to. After intensive testing, an approval was sought and obtained and a new market was established. The improvements saw the ultralight evolve as a safe, low-cost, and easy-to-fly aircraft suited to a lot of people who could not afford to go into GA flying. Some ultralights of today are stronger, lighter and go faster than some GA types and are sought after by a lot of older pilots for whom the CASA medical is a bit harder to come by.

The training. Training is carried out in a certified two-place aircraft registered with the RAAus (Recreational Aircraft Australia, formerly AUF) by certified instructors who must be qualified and operate from a RAAus approved Flying Training Facility under the scrutiny of the RAAus Operations Manager. The aircraft must be serviced and maintained by a Level 2 authorised certificate holder.

The course takes a minimum of 20 hours to complete and must include five hours of solo flying. Upon completing the course, consisting of ground and in-the- air training, the candidate will receive his/her pilot certificate which will allow him/her to fly an ultralight aircraft within a 25-mile radius of the departure airfield. Two exams – the rules of the air and basic aeronautical knowledge – must be passed. A passenger-carrying endorsement is available, as is a cross-country endorsement. The new certificate holder will also be taught to service and maintain his/her aircraft and becomes a Level 1 maintainer.

The Ultralights. In some ultralights fitted with an uncertified two-stroke engine, it's a matter of when, not if, the engine will fail. To deal with this pilots have several lessons in forced landings. As with most aircraft, ultralights do glide – some better than others – but keeping clear paddocks in view at all times makes for safer flying. The methodical servicing and maintaining of the engine will eliminate 90% of the problems encountered with two-stroke engines. The higher- priced ultralights have four-stroke engines fitted and are more reliable, but still need proper care and attention.

The flight envelope of an ultralight is much narrower than for its GA counterparts due to its high drag and low inertia, and this must be kept in mind at all times. With some of the more exotic types of ultralights made from fibreglass and composite materials, drag has been reduced substantially, resulting in better performance.

I hope this has been of interest to the reader. A more comprehensive outline and description can be found at the RAAus website www.raa.asn.au.

**Steve Vette is an RAAus-approved ultralight Chief Flying Instructor.*

LOOK OUT!

Our flying instructor, Kevin Lathbury, has some good advice for us all

See or be hit! The common term may be “see and avoid”, but either way it highlights the reality that, as VFR pilots, it is our responsibility to see other traffic before it fills our windscreen. As the best collision-avoidance aid is the “Mark I eyeball”, it is worth considering some of the strengths and limitations of our eyes so we can optimise our lookout.

The retina is the back of the eye. Images fall on it, so it is our equivalent of the film in a camera. The retina has a central point called the fovea, and visual acuity – the sharpness of the image – is much clearer on the fovea than on other parts of the retina. Focus on the word “fovea” on the previous line and see how many words you can clearly see on either side of “fovea” without shifting your focus. Maybe one or two? This illustrates that unless you are looking directly at something distant and making the image fall on your fovea, you may not see it clearly. So keep your eyes moving and make sure that distant aircraft that’s out to get you paints its image smack bang on your fovea.

Another little trick that illustrates the need to keep your eyes moving involves peripheral vision. Look ahead and hold a finger up to the side of your head. Wiggle the finger and hold it so you can only just see it out of the corner of your eye. Then hold your finger still. You won’t be able to see it. This illustrates that the very periphery of your vision detects only movement. An aircraft on a collision course with you will appear to be stationary in your windscreen (no relative movement), so your peripheral vision will not pick it up. Solution – keep your eyes moving so the aircraft gets out of your peripheral vision and onto your fovea.

You need a friend for the final party trick in this edition of Flyabout. Get said friend to hold their finger at the limit of peripheral vision (as per Party Trick 2), then move their finger in a 180° arc and follow it with their eyes. You’ll notice their eyes move smoothly. Then get them to do the same thing with their eyes – move through 180° – but without the finger to focus on. You’ll notice the eyes move in little jerks, or flicking motions. These little movements are called saccades. If your eyes are focused on an object crossing the sky in front of you (like the finger), then your eyes will move in one smooth continuous movement. But if you are scanning across an empty sky, your eyes will do the saccade thing – focus, flick, focus, flick, focus. While your eyes are flicking, they are blind. In effect, you have a series of little blind spots across the sky, which is clearly not very handy with all those aeroplanes out there trying to hit you.

What this means is that you may hear some traffic so you scan for it. You know it’s there but you can’t find it. That may be because in your scan, your eyes “flicked” past the traffic in one of their saccades. Look away, look back at the same spot, and chances are this time your focus will land on the aircraft.

Happy flying, and look out!

WHICH OIL IS BEST

Part two of an article on multigrade oils reprinted from Aeroshell Tech Talk.

Why use them and what are the differences?

In order to answer this question, we first need to look at what an oil does and how it does it.

Oil has many functions to perform in the engine, but the primary one is to reduce friction between moving parts by separating moving surfaces with a layer of oil. This oil must not only separate the two surfaces, but must also support any load that is being applied between them, so that the load can be transferred from one surface to the other.

If the oil did not support this applied load, then the two surfaces would force through the oil film until they came into contact, potentially causing significant and irreparable damage.

An important indication of how much load an oil can carry is the measurement of the oil's viscosity.

Viscosity is the resistance to flow of a particular fluid. Under the same conditions a liquid with a low viscosity, such as water, will flow more quickly than a liquid with a high viscosity, such as syrup. However, in general, an oil with a high viscosity will support more load than one with a lower viscosity.

There is an obvious balance to be struck here between having the oil viscous enough to support the required amount of load whilst also being fluid enough to pump effectively.

The problem is further compounded by the fact that as an oil is heated, the viscosity drops and vice versa. This relationship between temperature and viscosity is known as the viscosity index; the higher the viscosity index of an oil, the less its viscosity changes with temperature.

The ideal situation is to have an oil whose viscosity doesn't change with temperature, so that it maintains the same load-carrying ability as well as the ability to be pumped at all temperatures. Unfortunately this is impossible to achieve, so we are left with certain compromises.

The majority of the aviation piston engine oils on the market are mineral monogrades (both the straight and monograde ashless dispersant or 'W' oils). The viscosity indices of these mineral oils are fairly uniform and relatively unimpressive due to the very nature of the base oils used.

This means that whilst a higher grade oil (e.g. 100) oil may be satisfactory for operation during warm weather, it may well become too thick to pump effectively at the lower temperatures experienced at start up. Conversely, if a lower grade oil (e.g. 80) is used during hot weather, it may not prove to be viscous enough to support the loads required when at the elevated operating temperatures.

This is why many engine manufacturers advise that the oil grade is changed as climatic temperatures change. Note: you should always refer to your engine manufacturer's recommendations for clarification on which grade to use at which temperature.

The ideal solution to this is to produce an oil which has a higher viscosity index (i.e. its viscosity changes less with temperature). In this way in cold weather it will pump effectively, but still support high load at high temperature.

This is the concept of the multigrade oil and there are two principle ways of achieving these objectives:

Mineral Multigrades

Mineral multigrades use a light-weight mineral oil (the same as a light-weight monograde oil), but include an additive called a Viscosity Index Improver. The best way to visualise this viscosity index improver is as a long-chain molecule which curl up like a ball of string when cold, but then uncurl as the temperature increases.

Thus when an oil is cold, the presence of the viscosity index improver has very little effect and the oil flows well as the base oil is a low-viscosity oil. As the oil heats up, the viscosity index improver uncurls with the effect that it tends to restrict the motion of the oil, or 'thickens' it, which to some extent counteracts the decrease in viscosity of the base oil. This enables the oil to support more load than would otherwise be possible.

However the viscosity of an oil which contains a viscosity index improver depends on the rate it is made to flow (or sheared). It may decrease rapidly if the oil is sheared rapidly, and this decrease can be temporary or permanent.

A temporary loss in viscosity develops when high shear rates (which frequently occur in engines when one surface moves quickly past another) force the large viscosity index improver molecules to align themselves in the direction of flow. More seriously, a permanent loss of viscosity may occur if the shear rate is sufficient to physically break the large molecules into smaller units. This can happen in oil pumps and the like. Both of these scenarios reduce the oil's viscosity and therefore the load-carrying ability.

The vast majority of 20W-50 aviation multigrades on the market are mineral multigrades.

Semi-Synthetic Multigrades

Semi-Synthetic oils use a blend of mineral oil and a synthetic hydrocarbon oil.

Due to the naturally high viscosity index of the synthetic oil - its viscosity changes less with temperature when compared to mineral oils - there is no need to add a viscosity index improver.

Another advantage of using a semi-synthetic oil is that the synthetic component of the oil has a higher thermal stability and therefore degrades at a slower rate than mineral oils. This leads to the oil both performing as an effective lubricant for longer and also producing fewer acidic compounds, the byproducts of oil degradation, which in turn reduces the risk of acid attack in the engine.

AeroShell Oil W 15W-50 is virtually the only semi-synthetic aviation mutigrade on the market at present, and has given years of excellent performance throughout the world.

The obvious question is: "Why not produce a fully synthetic oil if it so good?"

The answer is simply that, unlike automotive engines, aviation engines run on Avgas, which contains a high concentration of lead. The combustion of this fuel inevitably leads to lead getting into the oil in the crankcase where it could form lead deposits, and may result in subsequent failure. However if the oil has a mineral oil content to it (either a fully mineral oil, or a semi-synthetic) then the lead is dissolved by the oil, whereas a fully-synthetic oil does not have the capacity to do this.

One of the advantages of using AeroShell Oil W 15W-50 comes when the aircraft is not flown frequently as the oil contains both a corrosion inhibitor and an anti scuffing additive (LW16702) to help the occasional flyer.

If the aircraft cannot be flown with the frequency required to keep the oil 'dry' (a minimum of 1/2 hour cruise every 2 weeks), the corrosion inhibitor will suppress the formation of any corrosion during periods of inactivity, which would otherwise form due to the action of acids and water.

Furthermore, once the aircraft engine is started up after being inactive, the anti scuffing additive will have coated all the internal metallic surfaces with a molecular layer so that metal to metal contact is prevented if there is no oil present. This is particularly important during the first few seconds after start up as the oil pump will not pump oil to all the extremities of the engine immediately.

Again not all oils contain these additives, but combined with the natural advantages of using a semi-synthetic oil, we believe that AeroShell Oil W 15W-50 represents the premium quality choice in the aviation piston engine oil market.

HOW GOOD ARE YOU DECISION-MAKING SKILLS?

When I was learning to fly in Toronto, Canada, in the early 70s my instructor taught me very little about making judgments and decisions. Judgments and decisions were something you learnt "on the job". Yet, as we all know, flying involves a constant series of judgments and decisions. In fact, poor judgment and decisions have factored in many pilot-related general aviation accidents.
Therefore learning how to make safe judgments and decisions is just as important as learning how to take-off and land.

Before we get to understand more about judgment and decision-making, let us define what we mean by the terms. There are numerous definitions, but my preference is the following:
"Good judgment is the ability to see and choose between available alternatives (to address a particular issue or problem at the earliest opportunity) such that the choice made results in the safest possible outcome".

From the definition you can see that before any judgments or decisions can be made, a pilot must first recognize that there is an issue or problem about which a judgment and decision is required. If a problem such as a failed vacuum pump is not recognized, then you simply are not in a position to make a judgment and decision no matter how knowledgeable and skilled you are at handling such a situation. Furthermore, in order to maximize the number of options available to you, the problem or issue must be identified at the earliest opportunity. In general, the longer you take, the fewer options there are to choose from.
For example, consider the case of a pilot who is in a hurry and does not properly assess the weather, but proceeds with a flight in marginal VFR conditions that are, in fact, forecast to deteriorate. One of the options is to postpone or cancel the flight, but such options are obviously not available to you once the flight has commenced, with the likelihood of a safe outcome somewhat diminished.
Of course, even if a problem is recognized early, you may not be in a position to identify all the options if you do not have sufficient knowledge and experience. For example, if you are not familiar with all the factors that influence the required landing distance you could easily make an erroneous choice when deciding to land on a short bush airstrip

Even if you know all the options you may be so inclined as to choose the less safe option. Take the well-known case of "get there-itis". A pilot may well be aware of the option to turn back on encountering a lowering cloud base, but instead makes the decision to press on in the hope of making it through. Such an attitude can have fatal consequences.
You may also choose the wrong option if you do not fully understand, or have an incorrect perception of, the level of risk associated with that option. This can occur when a pilot has taken the same risk before but "got away with it", thus being lulled into a false sense of security.

Choosing the right option that leads to the safest possible outcome, therefore, requires an understanding of the level of risk associated with each option and a mental mind-set that does not disregard or cloud the judgment about the level of risk.
Poor judgments and decisions can lead to errors. While one error generally does not lead to an accident, a chain of errors can significantly increase the likelihood of an accident. An example of a chain of errors leading to an accident is the case of a pilot who:
- Was scheduled (at the "eleventh hour") to fly in an aircraft other than the one flown normally.
- Only had a small number of hours on the aeroplane type and last flew the aeroplane for half an hour over three months prior to the flight.
- Did not have time to study the flight manual or obtain a detailed briefing.
- Checked the weight and balance based on 80 kg per person (the actual total weight was heavier and, while just under the all up take-off weight limit, was outside the C of G envelope)
- Set the flaps at 10 degrees on instructions from the Chief Pilot (when in fact the POH required a different setting for short field take-offs
- Took off from a short airstrip with 5 passengers but could not gain height and crashed at the end of the runway.

What were the possible errors? Firstly, the pilot flew an aircraft with which he was not fully familiar and on which he was, in all likelihood, not fully proficient. Secondly, the pilot apparently did not consider it necessary (or was not familiar with the mandatory requirement) to use the actual weights of the passengers even though the total weight was just under the maximum limit. And finally the pilot took the Chief Pilot's word as to the flap setting without checking.

Consider another example. In this case a pilot:
- Prepared a flight plan that was written in a manner not in accordance with conventional flight planning techniques.
- Carried out additional sightseeing during the flight.

- Did not appear to have recorded the flight's progress on a fuel log or similar monitoring system
- Carried out an unscheduled landing.
- Continued on to the destination but crashed short of the runway due to fuel exhaustion.

In this case the pilot, for one reason or another, assumed that a non-standard flight plan would suffice. By not recording the flight's progress on a fuel log the pilot increased the risk of running out of fuel. Then, after the intermediate stop, the pilot considered there would be sufficient fuel for the final leg.

There were clearly numerous judgment and decision-making errors in these two examples. The reasons why they were made are unclear but the fact remains that they were preventable. There are a number of actions that pilots can take to improve their judgment and decision-making capability:

- Learn about the risks associated with flying and utilize strategies and tactics that minimize these risks.

- Recognize any unsafe attitudes/behavioral characteristics you may have (that may surface under pressure) and consciously avoid them – such as "get there-it is" and succumbing to pressure from others despite your better judgment.
- Have a "what if?" approach and pre-plan your options during pre-flight preparation giving due consideration to the four main areas of risk – the pilot, the aeroplane, the environment and external pressures.
- Ensure you have sufficient recallable knowledge and experience relevant to what is required for the flight to be undertaken.
- Use a systematic problem-solving process for handling in-flight problems. A systematic process allows you to prioritize and assess information in a logical manner, limiting the impact of ego and emotion. Such a process should be used no matter how experienced you might be.
- Avoid the dangers of false hypothesis (rationalizing something irrespective of the flawed logic) and expectancy (where you are so focused on something you ignore the warning signs of a gathering unsafe situation).
- Expect the unexpected.

And last but not least, be prepared to deal with the situation as it is and not as you planned it would be. Safe judgment and decision-making is a skill that can be developed and improved with education and training. Poor judgments and decisions can be fatal.

**This article is based on extracts from A Pilot's Guide to Safe Flying written by Sander Vandeth and published by mCOVE Resources. It is reproduced with the kind permission of Pacific Flying magazine.*

CLUB CAPTAIN'S REPORT

The February Club Competition was held in perfect weather, with the wind almost straight down runway 14. Using CMP, competitors had to fly from Northam to the Grass Valley wheat bins (quite hard to spot because they've been dismantled), then back to the airfield for a normal circuit and touch-and-go spot landing. Pilots had to nominate climb and approach speeds, and points were deducted for variations.

The second circuit involved a glide approach and spot landing – quite a difficult task even in good conditions. Errol Croft was the only competitor to touch down in the landing zone, and was awarded first place for the day. Second was Tony Rees, with Ian Berry in third position.

It was a pleasant morning's flying for all. Our next competition, on Sunday March 12, will entail flying away from the field to certain landmarks. Come along and join in the fun – the action starts at 9 am.

Ray Howell
Club Captain

ooOOoo

A BRAIN TEASER

What will be the difference between the QNH and the QFE at YNTM on April 1st, at 04:00 UTC ?

How would you convert Millibars to Hectopascals (hPa) ,

On the Perth VTC, 3 NM West of YNTM, you find the word "Mast" and the figure "1170", (which could very well be the transmitter mast of radio station 6AM).
(The figure 1170 may vary from map to map as those things sometimes grow between different versions of the maps…)

Does that figure (1170) show:

- the height of the mast above sea level,
- the height of the top of the mast above the ground
- the height at the base of the mast
- the frequency of 6AM

Club Calendar

February 12th	**Committee Meeting**
March 4th	**BBQ starting at 6pm**

Bar Roster

Opening hours
Saturday 5pm –7pm
Sunday 5pm—7pm

February	**18th & 19th**	**Joy Flegeltaub**
February	**25th & 26th**	**Mike Bairstow**
March	**4th & 5th**	**Steve Vette**
March	**11th**	**Claude Meunier**
March	**12th**	**Tony Rees**
March	**18th & 19th**	**Mat Bignell**
March	**25th & 26 th**	**Les Ballantyne**
April	**1st & 2d**	**Gren Putland**

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