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For recreational pilots
MAY 2015 VOL 45 (5)

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Photo credit: Air Creation

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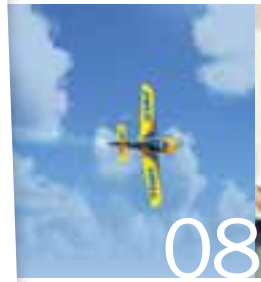

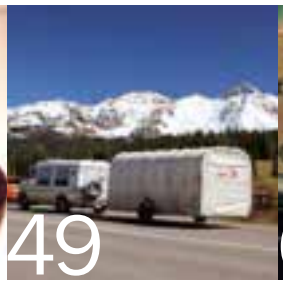

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ONE MAGAZINE - TWO FORMATS
From July, your monthly copy of Sport Pilot will stop arriving automatically in your mailbox. You can get it free of charge online at www.raa.asn.au. But if you prefer a hardcopy magazine like you now get, here is how you subscribe.

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President's Report

MICHAEL MONCK

Hard decisions

I often talk about history - which might make it seem I'm always looking backwards. I'm not. I'm the first to say you can't drive a car by looking in the rear vision mirror.

But I'm also the first to say you shouldn't change lanes without looking over your shoulder. We've had a tough few years. We've been running a deficit budget for some time and we've had periods where the regulator has withdrawn our privileges. We've been criticised for our poor governance and staff turnover. Some of these things have been fixed but others still need attention. We have to make some hard decisions if we are going to continue to improve.

Hard decisions imply they won't always be palatable and this is no exception. For some time there's been money spent on nice luxuries (like the magazine) and not enough on important tasks (like accurate record keeping). This needs to change.

For many years the magazine has been provided to members at a cost of around $400k a year. Similarly, for a long time we spent no money investing in safety at an organisational level. These priorities need to be rebalanced. Our three largest areas of expenditure are wages, insurance and the magazine.

The first of these areas, wages, has resulted in changes largely invisible to most members. We've reduced office staff numbers by approximately three people compared to this time last year. Some people have left and others have come on board, but the net change is around three positions.

It has meant the staff who remain have had to step up. We should take our hats off to them. One thing which should be noticeable is the reduced time you need to spend to get your membership renewal and aircraft registration processed. While the number of staff has reduced in both these areas, the improvements in office efficiency have meant the time taken has also reduced. Our office staff is working harder than ever to deliver more with fewer resources.

Similarly, we have been working hard to deliver more bang for our buck in terms of insurance. This year we haven't managed to negotiate a discount, but we have extracted a higher level of service in this area.

It means that, in real terms, we have improved efficiency and achieved a higher level of service for the same level of input. The level of cover we now offer is better than in previous years. Our third party property cover has risen from $5m to $10m.

Likewise, our third party personal injury cover for passengers has been increased to $250k from its previous level of $100k. This represents an improvement of 100% and 150% respectively for no real change in price. Our CEO and his team are also currently negotiating new insurance products for members - more news on that in a future column.

The last of the big three expenditure items is the magazine. As mentioned above, this has cost hundreds of thousands a year to produce and there has been no commensurate change in fees to reflect the change from when it was a simple A4 newsletter style note to the professional publication we have today. Put simply, we cannot afford to continue this or we will go broke.

So to reduce the magazine costs to a manageable level we will offer the publication for free via electronic delivery.

If you want a paper copy, this option will still exist too. We'll just ask that members that you give a little more - like the staff and our insurers are doing.

I've heard constant references to the fact that in the past we've run notable surpluses and that we must be doing something wrong today if we can't maintain them. I've also heard people accuse the current board and management of passing the buck by blaming our current situation on the errors of the past.

The simple fact is this – our cost structure today is higher than it was previously because we have to perform tasks today which we didn't in the past.

What I am saying is this. I am willing to make the hard decisions and accept responsibility for our problems. I'm not passing the buck. And neither are the rest of your board and management.

So I have chosen to accept a few harsh phone calls from a few people who aren't happy with the hard decisions we are making, rather than oversee an organisation which is not viable and one which could collapse in a few years.

And tomorrow we'll all get to go flying - even those people who are making the unhappy phone calls.

Calendar of events

2-3 MAY

A Inglewood Fly-In

A great weekend on Queensland's Darling Downs. Free camping, showers and toilets. RDFS fundraiser. 9am Saturday poker run. Presentations Saturday night. Breakfast Saturday and Sunday from 6:30am. BBQ lunch from 12. Three course dinner under the stars Saturday night. For more information, Stuart 0447 737 002 or Lexie 0407 195 205.

2-3 MAY

B Wings Over Illawarra

Another big weekend for the entire family with a wide range of activities and displays, including air displays of aerobatic, historic, modern and military aircraft along with defence force exhibits, static aircraft displays, classic cars and bikes, amusement rides, merchandise and food stalls. Gates open 9am Saturday and Sunday. Air display starts at 11:30. For more information, www.wingsoverillawarra.com.au.

22-24 MAY

C Old Station Fly-In & Heritage Show

Raglan, Queensland. The fly-in will feature Australia's Red Bull Air Racing Champion, Matt Hall, and hopefully the ABC's Macca doing his Sunday morning radio program. There will be a welcome dinner Friday night. Saturday will feature a truck show, joy flights, vintage tractor pull, heritage machinery, children's entertainment, fashion parade and air displays. Proceeds go to the Capricorn Helicopter Rescue Service.For more information, Leonie (07) 4934 6562, leonie@creedgrazing.com.au or Ron 0408 346 536.

30-31 MAY

D Casino Beef Week Fly-In

A fun weekend for everyone, on and off the aerodrome. Fly in Saturday and stay the night. Overnight camping welcome. A dinner will be provided at the aero club.Weekend Beef Week activities include a street festival and markets, Show'n'shine, Wood chopping competition, whip cracking, rodeo. Adventure flights and aviation chat all weekend. All amenities at the aerodrome including catering, sausage sizzle, coffee and cake. For more information, www.casinobeefweek.com.au or contact Russell 0427 627 477 or Debbie 0438 627 607.

30 MAY

E Watts Bridge All-In Fly-In

The Watts Bridge Airfield Open Day will celebrate the rich diversity of all forms of recreational aviation.
Watts Bridge, in the Brisbane Valley, is the home of a wide range of aircraft.
The All-In Fly-In is an all-day event with on-field catering, coffee and Avgas available. Entry is free with no landing fees. For more information,
Richard Faint 0412 317 754 or www.wattsbridge.com.au.

F **7 JUNE**

Biggest Morning Tea

The Moruya Aero Club will host a Biggest Morning Tea to help raise money for cancer research and support services. Fly or drive in. The event will begin at 11am.
For more information, cameron@ignitionaerospace.com. To make a donation directly.
http://nsw.cancercouncilfundraising.org.au/MoruyaAeroClub

G **6-7 JUNE**

Sunraysia Queen's Birthday Fly-In

The annual event will be on again at Wentworth in NSW, 15nm NE of Mildura. Saturday will be the main open day. Activities will include static displays of vintage motorcycles and cars. Three course meal Saturday evening. Breakfast Sunday morning for visiting aircrew. Public welcome. BBQ Lunch and cold drinks available during the day. For more information Brian Middleton (03) 5022 7783, 0408 690 650 or brianmiddleton12@iprimus.com.au.

CANBERRA BIG BOYS TOYS EXPO

H **22-23 AUGUST**

Big Boys Toys Expo

Exhibition Park in Canberra. The first of its kind on the east coast, this two-day interactive expo will create the ultimate playground for Canberra and the region's 'big boys' to see, touch, experience and buy all the toys, tools, gizmos, gadgets, sports and hobbies they've always dreamed of. 10-5pm daily. $15 entry. Kids under 15yrs – gold coin. For more information www.bigboystoyscanberra.com.au

I **12 SEPTEMBER**

Wings Over Warwick

Queensland Recreational Aircraft Assn incorporating Warwick Aero Club (www.qraa.info) invites pilots and enthusiasts to Warwick Aerodrome (YWCK). The strip is 1600m all bitumen with no landing fees (www.warwickaerodrome.com). Includes model plane display. Food and drinks available.
For more information, Graham Hawthorne 0427 377 603, Kelvin Hutchinson 0407 733 836 or Phil Goyne 0417 761 584.

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LETTERS TO THE EDITOR

A rose by any other

Re 'CASA's big feet' and 'hidden stresses' *(Sport Pilot* Letters to the Editor March 2015).

We may agree/disagree with some aspects of these letters and none of us should begrudge the writers the right to express their views. However, why does the editor allow it to be done 'Name withheld by request?'

Surely if a contributor has the courage of their convictions to have and express their views, why are they then without the intestinal fortitude to allow the rest of us to know about whom we are reading? If they are worried about possible retribution, who are they scared of? Come on *Sport Pilot*, how about a 'no name-no publish' policy? Or maybe don't publish any names? Bloody hell, have we become so thin skinned we can't handle constructive criticism?

-Name withheld by request

Oops sorry, Roger Hall

From the Ed - *Writing letters is voluntary Roger. There are people who honestly believe CASA or RA-Aus might punish them for stating views contrary to official policy. And others who believe they might be subject to harassment if they complain or dob in a law breaker. I prefer to have readers feel confident enough to contribute their opinions. The message remains the important thing, not the messenger.*

Good planning

In relation to 'Slings Go' letter *(Sport Pilot* February 2015). Having done quite a few long distance expeditions in GA aircraft over the past 40 plus years, and a few RA-Aus trips in recent years, I would make the following suggestions to the author.

Generally speaking it is reasonably easy to avoid controlled airspace if that is your desire. For example, to avoid Rockhampton you can go to Emu Park and for Mackay it is simple to fly west of the zone. Townsville can easily be avoided by going to Charters Towers and Cairns by tracking to Mareeba. Obviously it is necessary to stay below the zone steps. At some of the less busy airports such as Rockhampton and Broome, it may be feasible to arrive and depart outside tower operating hours.

Unfortunately it will quite often be simpler to use Avgas than Mogas at some major towns. Firstly, if flying long legs, a considerable number of jerry cans will be required, sometimes in places where there is no taxi service. Secondly, in the more remote areas, the only Mogas will be 91 octane, so carry octane booster just in case.

To save space there are 20 litre fold up jerry cans available for a little over $100 each. There is a web site 'Airstrips near pubs and food' that is worth visiting when planning trips. The most important thing to make a trip enjoyable is thorough planning. That means after deciding your preferred route, make phone calls to check the information such as fuel availability is correct, not assumed. The AOPA Airfield Directory is a great help when planning, however current maps and ERSA are required during the trip.

There is an Android App available which allows you to send a text code, text or email with your position, speed, height and direction to up to five nominated receivers. My code is two question marks; however the App does require a mobile phone signal which will, of course, be a problem at low altitudes in remote areas. The speed is in metres per second; however double that number for approximate knots.

Generally speaking I do not book accommodation, or at least not until the day before arrival. The trip is then fluid, so that unknown sights can be visited as they come to light and boring places can readily be left behind. I may be easily pleased though, because all I require are clean facilities, not stars. I do carry light camping gear for emergency use; however so far have never used it. Obviously travel up north during the dry, and expect south easterly winds up to about 7,000ft.

I have at times organised for a drum of fuel to be waiting for me in places such as Drysdale River Station. I am then able to base myself there for a few days and explore the area by air. Don't be surprised at fuel prices and Birdsville may be the worst around. Kalumburu was over $3.50 for 91 octane last time I was there.

With good planning long distance flying is a joy, however also addictive. It is an unfortunate fact that the more aircraft in convoy, the more complicated the planning and execution of the plan. Enjoy.

-John Michell

Low flying

Reference the letter written by 'Name withheld by request' (*Sport Pilot* March 2015).

If I were him or her I would hide behind a wall too. If a pilot is to survive flying under 500ft on a regular basis he needs, in my book, training in excess of 35 hours ICUS to gain even a small handle on this totally dangerous world. If a pilot flies continually below 500ft without adequate training by a very experienced low level operator, he will crash and burn.

70 per cent of all ag pilots who hit wires die or burn. Even with hours of training on identifying wires, seeing them and working out the various directions they are swung, never become complacent. In my training area, high tension wires and towers can be 350ft above the ground and new ones are appearing regularly. 150ft above them leaves very little margin for error.

There are also mobile towers, smoke stacks, wires over deep ravines or gullies. Have you ever experienced spatial disorientation? Most pilots die before they know what killed them. Take lessons.

-John Dingley

Partial failures

It is interesting that students and passengers of Jabiru-engined aircraft will be asked to sign a statement that they realise the aircraft could have an engine failure, because they have recently had more engine failures than Rotax. Who will word the statement? Will Rotax flyers have to sign a similar statement? If they don't, this will mean that passengers in Rotax-engined aircraft can relax in the knowledge that their aircraft will never have an engine failure. If it does, they will be able to sue the socks off CASA for not telling them that this could happen. If it is suspected (no proof necessary, of course) that Lycoming has more engine failures than another brand, say, Continental, will they be banned from night flying, flying over populous areas and require their passengers to sign similar statements? Or does CASA have defined acceptable and unacceptable numbers of failures? If a particular converted car engine has more failures than Rotax or Jabiru, have they been similarly notified?

But first CASA must give us its definition of engine failure or partial engine failure, before this line can be drawn. Does a fouled spark plug, even in a dual ignition engine, constitute partial engine failure? I would argue it does. Perhaps you think my remarks are facetious but I mean every word. There are so many holes and implications in this ill-conceived proposal, it simply offers further proof of something the industry has long known - that CASA is an adversarial organisation interested only in its own self-importance, incapable of properly administering aviation in this country and respecting the people who are the reason for its existence.

Its action against Jabiru can only be seen as a deliberate move to destroy a truly Australian company that has built a global business in an industry previously dominated by US and European companies. It also means thousands of enthusiasts who have proudly chosen to buy an Australian product over an overseas brand, are faced with an enormous economic loss if CASA is allowed to succeed. Who will word the statement?

Name withheld by request

From the Ops Dept - *The Instrument issued by CASA in December provides suggested wording for the statement and is available on the Comlaw website, http://www.comlaw.gov.au/Search/292-14*

L1 assessment test

Recently I took the trial L1 assessment test. I would like to recommend that everyone takes it to see where you stand as far knowledge goes.

It is not difficult and there is ample time to get it right as you have all the answers before you. Just read the question with care, one word in the question can lead to a wrong answer.

The object is to improve knowledge and raise the standard of L1's. Without any study and reading I managed to pass, did the exam quickly or as quick as I could.

All in all it was well done by the Assessment team. I believe there should be 100 questions or up to there. I also believe you should get two shots at it if you fail. It is all about gaining knowledge.

I believe also there should be an assessment test for L2's, who to some degree, nearly have the same rights as a LAME. One shot only and re-examined in 12 months perhaps, because if you know the regs, the L2 has a lot more to be responsible for with dire consequences if he gets it wrong.

If RA-Aus is serious in this area, make it so. Of course the L2 exam/assessment is for a different area of knowledge, but still within RA-Aus' manuals etc and, of course, CASA's jurisdiction.I commend the Technical Department for taking this step.

Keith Baker

From the CEO - *Keep an eye on Sport Pilot in coming editions for more news on training. Developing our membership and offering more training and development options is a core part of our strategic development in the coming year.*

ASIC woes

In January I received a renewal notice for my ASIC, which I have renewed for the past five years. Wanting to have it processed quickly, I sent off the completed form and required photos the following day. This year the whole package was returned to me explaining that I had not filled in the 'state' field in 'place of birth'.

My place of birth was Berlin, Germany and this has been the case for all my previous applications, my passports and my security clearance for the Australian Civil Corps. I rang the office and explained that Berlin is not in a state of Germany and also made the point that the renewal will now be delayed beyond the expiry date. It had no impact on the person I was speaking to.

I was then informed to put a note on the form and return it. My ASIC expired on January 21. It is now February 18 and I only received notification yesterday that my forms have been forwarded for processing. I know there is a lot of contention regarding ASICs and I also know that it is a requirement, so how about assisting us to do the right thing without the bureaucratic bungling. I hope the people born in London, Paris or Rome don't have to go through the same thing.

Ingo Steppat

From the CEO–*I am informed that you have now received your new ASIC. RA-Aus responded to the government's call for submissions on the management and issuing of ASICs. We get as frustrated as our members and we work hard to help make this process as smooth as possible.*

Renewing membership

During my latest membership renewal I was taken aback by the lack of notable security with the online payment. Would it be possible to have PayPal or some other online secure payment facility incorporated into the renewal process? I understand the code you enter when prompted is designed to identify the member, but for the payer there is no notable sign or legitimate indication the website to which the member is directed is secure (excluding the lock icon within your tool bar). Would it make sense to improve the online renewal process, as opposed to sending highly confidential information via the mail?

I may be showing my age, and some may argue that this is how it has always been done, but companies like PayPal and Visa etc. offer monetary insurance and the ability to dispute errors and anomalies. These companies are also used on a day-to-day basis and now have an everyday place in our current society i.e. people can associate with them. Furthermore with the current system no customer reference number or printable receipt is given after processing payment which, to be honest, should be implemented immediately.

Also, can the option be added to make the medical declaration online as well? Having to split up the renewal notice and then still mail it off doesn't make for a streamlined experience. The document seems to lack any true declarative authority in its layout and content (e.g. the witness line doesn't even ask for a name, thereby removing any certification. Furthermore, on a separate note there is no return address on the page, which means searching again for that front page).

I know the documents were revised recently, however if the member is going to take the time to do this process properly, maybe the document could be revised to ensure the document is doing what it is designed to do.

Also, if you have a class 2 medical, the expiry date is clearly written within the renewal notice - does it remain necessary to declare annually? I understand linking these two pieces of information may not be as simple as it sounds on paper but considering the organisation already has this information seems like an invaluable use of time for the member.

And there are policies and instructions in place through various legislation which identify if a member is not medically fit that they are to inform RA-AUS of their change in circumstance.

-Nathan Fernandez

From the CEO - *RA-Aus is currently modernising our systems which will address your security concerns.*

Digital versions

Please don't insult our intelligence by stating that all members will receive a digital version of our magazine free of charge (*Sport Pilot* news April 2015). The fact is we have always paid for the magazine in its printed form as part of our membership annual fee.

Increasing the membership cost by double dipping on the printed version of the magazine is not what I call good management and will only accelerate the exodus of members from this organisation.

Perhaps the executive might like to try a different approach. The problem should be addressed as other organisations have where savings can be made by using digital technology. These savings should be passed on to the members in the form of a reduction in membership fee of say $22 to those who are happy to use the technology.

The printed version should be as always included in the present membership fee and only available to paid members who chose that option. A download button should be added to the web site so anyone can purchase and download a PDF copy of the present and past magazines at a discount price to the newsagent version of, say, $5.50 current and $3.30 for past copies.

This option would get free promotion for RA-Aus by word of mouth from the members and perhaps a small amount could be spent on advertising the low cost availability of the magazine on the web, in other aviation publications.

This approach would reduce the risk of membership exodus. It's more likely to increase membership and at lower cost. It will stop the losses caused by having to produce excess copies of the magazine, and handling. Reduced costs equals less time, less postage, less paper, less ink, plus bonus less pollution. No need to produce free copies for flying schools as they can have their copy on computer or iPad on the desk for anyone to read.

Instead of doing surveys that only ask simple and repeated questions that don't really deal with the whole issue, why not ask the members what they want.

-Jim Crocker

From the CEO - *In March 2015 we experienced our strongest membership growth this year. There is no so-called exodus of members.*

The executive could have taken the easy decision and increased membership fees. (The last time fees were increased was January 2014. Prior to that 2011), but instead chose to explore other options.

Passing on a fee reduction would be our preferred option, but the organisation has slipped into deficit budgets running to hundreds of thousands of dollars a year and, as such, some tough decisions need to be made. Charging for the magazine gives members a choice. It also allows those who choose not to subscribe access to important, relevant and interesting content in a digital format.

Disappointment

I read with disappointment the recent article '*Sport Pilot* Goes Digital' (*Sport Pilot* April 2015).

I say disappointment because one of my on ground pleasures is receiving and reading our magazine from cover to cover. Now we learn that the almighty dollar is sticking its nose in again, dictating that cost is more important than members' pleasure.

If, or when, our magazine goes digital you may be certain that I, and many others (that's a considered opinion on my part), will no longer get to read the much enjoyed interesting leisure/experience articles and informative technical/political discussions. Not because we can't but because we find no pleasure sitting in front of a PC or tablet or smart phone awkwardly navigating our way around tiny screens.

It has always been much more satisfying having a hard copy magazine lying around the house waiting to be taken up for reading in the car (not while driving), on the lounge, on a shady veranda, in bed or dare I say it, on the throne. And on the occasion we wish to show a friend an article it's always been a simple affair to grab the mag and flick to the relevant page.

Not any more apparently, unless of course I volunteer to pay extra money to continue receiving the mag in the mail. Again, in my considered opinion, I believe the greater majority of our members would prefer to share the small extra production recovery cost in our annual membership fees to continue the distribution of the mailed hard copy to every member. I suspect that if we go down the path of a few electing to pay a larger extra subscription cost for their mailed copies while everyone else chooses not to pay, many of the latter group will not bother going on line to search out and read *Sport Pilot* on the small screen.

Once upon a time I regularly received in the mail 'Flight Safety Digest', a periodical magazine issued by CASA to all of its registered pilots. That went digital and I haven't read one since, for the same reasons as expressed above. It's a pity really, there was always something to learn from FSD, just as there is from *Sport Pilot*.

Maybe I'm just lazy. But I will miss reading *Sport Pilot*. Please stay with the status quo.

-Paul Nossiter

From the CEO - *Sadly if we stayed with the status quo, RA-Aus would quickly become insolvent.*

Producing Sport Pilot costs $400,000 per year and, by following the current strategy, we have the best of both worlds. Sport Pilot is an important part of RA-Aus, but we also need to plan for the future and take some tough decisions from time to time to ensure sustainability.

More on digital

It is most disappointing *Sport Pilot* is no longer going to be delivered to members in hard copy - unless we pay a premium for it.

RA-Aus is an organisation owned by its members and I don't recall anyone asking members if they thought this was a good idea. This is definitely something where a member's think tank should have been engaged. To management it is great to get rid of costs, but why stamp out the cost which keeps the organisation going?

What happens to my *Sport Pilot* when I have read it? I pass it to kids who have an interest in aviation. And when they have read it, it is passed to the old folks home. That is not the end of the magazine, though, as grandchildren visit those old folks and the readership circle starts all over again. Also many copies end up in aviation maintenance organisations and it is always good to have something newsy to read while the plane is being serviced.

Magazine readership is what encourages people to become members of RA-Aus, and, with only an e-magazine available, membership will surely fade.

Flight Safety Australia went electronic. I read the first edition and haven't read a single edition since. Why? Because I object to the enormous MB download required. One may expect a similar download MB to read a digital *Sport Pilot*. The matter of Flight Safety Australia being electronic was discussed at the Great Eastern Fly-In. It seems I am not the only one to have ceased reading it - and CASA knows it!

Do we get cheaper RA-Aus fees? No! Does management get more staff and more wages? Yes!AOPA has the right idea - produce a hard copy every second month and the electronic copy in the months in between. Why doesn't RA-Aus follow AOPA's lead? AOPA worked out long ago that people belong to that organisation to get the magazine.

I am not at all happy with some aspects of RA-Aus. The magazine was always good to keep me in touch. Now I get a dreadful bright orange e-flyer which is an eyesore. I never read that because of the presentation.

Come on guys! Don't sink the RA-Aus organisation! It needs to be kept afloat for the future of aviation.

-Margaret Howes

From the CEO - *RA-Aus offers members the best of both worlds. A printed magazine and / or a digital version.*

Members will still be able to receive a printed copy as they have in the past and share it, but yes, a subscription fee will apply. We could increase membership fees, but we feel it would be unfair to members who prefer a digital copy only. So we've kept membership fees where they are.

On the staffing issue, RA-Aus operates with two to three less staff than July 2014 and some staff have only been given award based wage adjustments in accordance with fair work laws.

Calling all ducks

Reading the article by Professor Avius (*Sport Pilot* March 2015) and having instructed in Maritime VHF/HF, I was pleased to see the notation in regards 'Push-Pause-Talk'. It goes toward acknowledging an issue with most radio communications which I believe has two components; failing to transmit the beginning of the message and failing to hear the first part of the message.

Push-Pause-Talk addresses the first of the two components.

The second, in my view, is because of a human factor. Saying 'Parkes Traffic' is less likely to be heard by the appropriate person than 'Traffic Parkes'. It also adds a level of safety for the first component, so it is actually a double fix. Having flown a little and been flying, navigating, and then communicating, I admit I have missed the first word/s of transmissions.

I have asked "where was he?" By saying the location after the word 'Traffic' it allows the human mind to acknowledge the radio is saying something and tune in to it.

I asked my instructor why it had to be 'Location Traffic', and not 'Traffic Location' and was told that was the standard. This seems to be supported by Professor Avius in his article.

I'd like to promote change, to add further levels of safety and usability. Great to see Prof Avius bringing up an important topic.

-Sean Harrison

Mechanical support

I am responding to a letter to the editor called 'Mechanics Mistakes' (*Sport Pilot* October 2014).

I would like to support Tech Manager Darren's judgement in including Mike Busch's article in the magazine. As we are all aware, maintenance is an issue under the RA-Aus spotlight and for good reason.

As a LAME of considerable experience and an avid Sport Aviator, I find Mike's article informative and thought provoking. Those who have heard of Mike will know he is a respected GA maintenance provider who is prepared to share his knowledge learned by experience.

His information bears relevance in every way to the maintenance we carry out on our recreational aircraft and should not be discarded.

As for the pitot/ static example mentioned by Mike, one must take into account that the C340 is a pressurised aeroplane. To say "the ASI, VSI and ALT stopped working" may not be 100% accurate language, but their ability to accurately indicate airspeed, rate of climb and altitude parameters would have been completely erroneous. The point he makes is 100% valid.

I have learned full well there is little difference between the human factors associated with maintenance which we carry out on our relatively meagre machines versus the maintenance we take as a given when we fly with the airlines.Thanks again Darren.

-Mike Grogan

Pilot Notes

In response to a recent comment by the CEO regarding Pilot Notes (letters to the editor *Sport Pilot* March 2015).

Personally I'd rather see them in the magazine. I have zero interest in John Smith from Victoria who wants to be a committee member or whatever. I'd rather read (and learn from) about mishaps other pilots had without having to troll around on some website. I rarely turn on my laptop these days, any internet stuff I do on my phone. Thank you for your hard work in producing our magazine!

-Tim

OMG

I have just read (and re-read several times) the letter to the Editor called 'hidden stresses' (*Sport Pilot* March 2015).

After having spent a wonderful 40 year career in aviation with 30 of those years as a LAME, and working on and maintaining aircraft ranging from a Blanik glider up to and including the Airbus A380, three words sprang to mind.

Oh - My - God!

The 'Weighty Matters' article was very insightful and, from the reaction you got, I think more educating articles should be published for the unenlightened. Perhaps more field days as well. Just my two bob's worth.

As has the author of 'hidden stresses', I too would like my name withheld.

-Name withheld

No Brad here

In response to Gordon Marshall's Letter to the Editor (*Sport Pilot* March 2015). Mr Marshall is correct in stating that advertising in a magazine that only goes to flying members is pointless.

As a cash strapped organisation we are stuck between a rock and a hard place. To help get the message of cheap affordable and fun flying to the greater public, I suggest members do as I do. Instead of hording past editions of *Sport Pilot* (which I used to do), I now drop mine off at the reception of my local doctor and dentist.

I really couldn't care less what Brangelina or Brad are up to and I don't think most of the public is either. I have had positive feedback.

-Art Williams

Got something to say?

The state of the organisation is reflected in the Letters to the Editor columns. The more letters – the healthier the organisation. So don't just sit there – get involved. Your contributions are always welcome, even if no one else agrees with your opinion.

The Editor makes every effort to run all letters, even if the queue gets long at certain times of the year.

editor@sportpilot.net.au

(By the way – the Editor reserves the right to edit Letters to the Editor to shorten them to fit the space available, to improve the clarity of the letter or to prevent libel. The opinions and views expressed in the Letters to the Editor are those of the individual writer and neither RA-Aus or *Sport Pilot* magazine endorses or supports the views expressed within them).

TIME RUNNING OUT FOR SP SUBSCRIPTIONS

By Michael Linke CEO

As I reported in the March and April editions of *Sport Pilot*, there are changes on the way for how you receive our great magazine from July.

Sport Pilot will be available in two formats. Members should choose the format best suited to their needs.

The first edition of a digital version of *Sport Pilot* will become available to members in June. Members who want to continue to receive a printed version will need to subscribe by June 30, when the monthly printed version will no longer automatically be sent to their letter box.

Printed copies will still be delivered to every flight training facility each month as a marketing and promotion tool to students and potential new members.

And all members, whether they subscribe to a printed copy or not, will enjoy free access to the digital copy.

The Board of RA-Aus looked at a number of options to deliver *Sport Pilot*.

The decision to go digital was centred on two key areas. Offering a digital alternative to members will help reduce some costs of production and allow *Sport Pilot* to be made available on a variety of electronic platforms.

At the same time, it was seen as an alternative to increasing membership fees for all members.

MARAP 95.55 CHANGES

An amendment to CAO 95.55 was released on 24 February 2015. The amendment will allow Recreational Aviation Australia (RA-Aus) to authorise and permit modifications to RA-Aus registered type certified aircraft. This process does not apply to LSA aircraft. These amendments are in the form of 2 new subparagraphs (1.2 (d) (iv) and 6.1 (f) (iv)).

Apart from this, there are no changes to the existing contents of CAO 95.55 except for updating certain provisions, including the exempting provisions mentioned in section 3. The changes only involve removing outdated references that are no longer in force and replacing them as necessary.

In relation to the amendments of CAO 95.55 that permit RA-Aus to approve modifications to RA-Aus registered type certified aircraft, these have been agreed after CASA was satisfied with the relevant procedures set out in the RA-Aus Technical Manual amendments. A MARAP frequently asked questions document (FAQ) is available under the Technical tab on the website.

MARAP will enable members to apply to modify their type certified aircraft. Some examples of modifications include but are not limited to engines, propellers and MTOW increases. In some circumstances applications may take up to 12 months, however in others the time to process the application may be shorter.

Recreational Aviation members will be able to make application using the Tech Manual form 014. Members will also be required to complete and provide an Aircraft Condition Report (ACR). Section 7.4.3 Annex B of the Technical Manual covers this requirement, which must be completed by a suitably qualified RA-Aus L2 privilege holder.

When an application is received the Technical Manager will review the application and make the initial decision to accept or refuse the application based on the information supplied by the applicant with Tech Form 014. In some circumstances the Technical Manager may request further information for clarity and/or additional data.

Members should follow the below 5 steps to familiarise themselves with the formal application process. Recreational Aviation Australia will further advise members of the necessary processes to follow as they become available. Any initial enquiries can be sent to techmgr@raa.asn.au

Step 1 – read the FAQ
Step 2 – read MARAP process document
Step 3 – download tech manual form 014
Step 4 – Arrange completion of an Aircraft Condition Report
Step 5 – Deliver the completed documentation package to techmgr@raa.asn.au or mail it to PO Box 1265, Fyshwick ACT 2609.

Sport Pilot Survey

As has been announced in the past few editions of *Sport Pilot*, the magazine is going fully digital in July.
As part of the changeover, we asked you to complete a survey about the magazine. Here are the results so far. 154 respondents.

1. How would you prefer to receive *Sport Pilot*?
Digital 42 (27.81%)
Printed 109 (72.19%)

2. What is a fair price to pay for 11 editions of *Sport Pilot* delivered to your letter box?
$6.60 38 (29.92%)
$7.70 67 (52.76%)
$8.80 17 (13.39%)
$9.90 5 (3.94%)

3. As a current *Sport Pilot* reader I read
94.74% everything

4. My favourite part of *Sport Pilot* is
The Regular columns – 9 (6.04%)
Columnists – 15 (10.07%)
News – 5 (3.36%)
Reader's stories – 4 (2.68%)
Features – 9 (6.04%)
Cover story – 2 (1.34%)
Extras – 5 (3.36%)
The whole thing – 100 (67.11%)

5. What people want to see in the magazine
Homebuilder stories
Accident and incident section
Technical (maintenance, fuel usage, technique, how to build)
More about different types of aircrafts (drifters and trikes)
Flight test on models
People touring
New applications for tablets and iPads

Thanks to all those who took the time to complete the survey.

AvPlan Launches V5.0

AvPlan EFB 5.0 is now available in the Apple App Store as a free update for all users. AvPlan EFB 5.0 is AvSoft's largest single release since its launch in August 2011. As well the company has launched a new website - www.avplan-efb.com - and new subscription engine.
AvPlan EFB 5.0 cements AvPlan EFB's status as a popular electronic flight bag in the US, Australia and New Zealand.

New Features Include:

- An updated interface for iPhone 6 and 6+;
- Audio alerts via Bluetooth or cable connection;
- Improved weather radar overlay;
- Jeppesen FliteDeck integration;
- Airport diagrams auto-load over maps when zoomed;
- Fuel prices;
- LSALT display and calculator;
- Quick flight planner;
  Auto dim;
- Glide range planner;
- Rocket boxes.

For more information, www.avplan-efb.com

Mary Anne O'Donnell (right) receiving the batton from Kristie Casey, Captain for Qantas Link, who took the baton from Mackay to Townsville

WOMEN'S BATON COMPLETES JOURNEY

It's been one of the biggest and most effective fund raising ventures in Australian aviation.
Hundreds of female pilots and cabin staff have taken part in a national relay to raise funds for the Cancer Council.
The Women Pilot's Relay of Flight began on March 2 at the Avalon Air Show and went anticlockwise around Australia.
A number of teams carried the commemorative baton over 30,000km. It was due to finally reach Launceston, Tasmania on April 22.
A variety of aircraft was used ranging from RA-Aus, GA, balloons, twin engines, helicopters, military - Navy and Air Force and commercial airliners.
The event was designed to celebrate camaraderie and the pursuit of aviation among female pilots while also striving to raise $20,000 for the Cancer Council.

"This year marked 25 years since the first NATFLY was held in Holbrook"

Some of the aircraft which made it to Holbrook over Easter

Paul and Gina Peebles Winner of the best VH Trophy arrived in their SportsStar

Russell Arthur arrives in his RV6 from Mangalore

Many of the visitors had questions for Dave King on aircraft electrics

The concentration is intense as the Viva Scout takes to the air

Club President, John Harley, gets the Skycraft Scout airborne

Back to Holbrook

BY MAX BROWN

PHOTOS: KEN WOODING AND JOHN HARLEY

More than 30 aircraft defied the forecast and the weather over the Easter break to attend the Holbrook Ultralight Club's 2015 Back to Holbrook Fly-In.

This year marked 25 years since the first NATFLY was held in Holbrook. The occasion was celebrated with a special cake made and decorated by Neville and Pat White's daughter, Tina. The club decided to take the opportunity to bring its annual event from November to Easter given the absence of NATFLY this year. It was hoped we might have better weather for the event but it was a gamble lost.

Among the notable highlights of the weekend was the flight of two aircraft from the Australian Ultralight Aircraft Museum collection based in Holbrook and flown by Club President, John Harley. The flights were endorsed by RA-Aus, in consultation with CASA, and the aircraft were temporarily registered for two days to allow the flights to be undertaken. The aircraft were a Mark I Skycraft Scout and a Viva Scout. Despite the rain, John was able to get each aircraft airborne on the several runs he did along Holbrook's main strip. Both aircraft had been prepared for the event by the club's own legend, Neville White.

The efforts of RA-Aus Technical Manager, Darren Barnfield and Assistant Technical Manager, Jared Smith, in getting permission to fly these aircraft, were greatly appreciated by club members and their visitors. Former RA-Aus Board member and Association Treasurer, Ian Shaughnessy, was allowed to taxi the Skycraft Scout, but due to the restrictions on the aircraft, he wasn't permitted to fly it.

Another highlight was the arrival of Peter Mclean and a gaggle of seven trikes from Yarrawonga. Following the usual roast dinner on Saturday night, Peter gave an amusing talk on his aviation experiences.

One of his flock, Noel Clifford, flying a Tanarg, took out the Best Two Seat, Rag and Tube Trophy. Peter also donated the prizes for the Fly-In raffle drawn during Saturday's dinner.

All three forums on the afternoon were well attended. The first was a talk on Aircraft Electrics by Dave King. Attendees were also enthralled by Graeme Planck's talk and demonstration on Sheet Metal Working and Riveting. Graeme used Bryan Gabriel's 50% replica P51 to highlight the difference between flush riveting and pop riveting (no comparison really). Ian Shaughnessy concluded the forums with a talk on the old days and 95.10 - appropriate really, given the flight of the Scouts earlier in the day.

Other trophy winners on the day were:

Best Single Seat Rag and Tube: Mark Howard flying a RANS S4; Best Jabiru: Graham Gubb and Barry Pascoe; People's Choice: Rob Lilywhite flying Forbes Aero Club's Foxbat; Best VH or Innovative Design: Paul and Gina Peebles flying a SportStar; Longest Distance Flown: Callum Burns and Margaret Pawley from Powranna, Tasmania, in an RV 9.

The RA-Aus Board was represented by Rod Birrell who flew a Topaz up from Sunbury.

All in all, and despite the weather, it was a most successful Fly-In with many of the visitors promising to come to the next event at Holbrook.

First flight for Elaine Stewart in Michael Carey's Sabre

Debbie Steward with Heli Adventures pilot, Johan Hoodguyn

Cranbourn launches

BY DEBBIE STEWART

Considering the forecast was rain, Cranbourn's fly-in at Launceston in Tasmania went off without a hitch.

Some pilots did not want to risk flying in, in case of bad weather for the return flight in the afternoon, but next time we will make it a free stay overnight, for the pilots and their families or friends.

"It was my first fly-in and I was sick with excitement."

It was my first fly-In and I was sick with excitement. I spent the whole day greeting people and making sure they were having a good time and making sure all their questions were answered.

Our hamburgers and sausages were praised by all and the people I spoke with had a wonderful time. We had pilots offering free rides for people wanting to see everything from above, which was very generous and helicopter rides as well.

The model helicopters were a sought after attraction and the kids loved the jumping castle and hay bale seats, plus all the room to run around.

The hangars were full of curious onlookers checking out the different planes and asking all manner of questions related to learning, purchasing and flying. It was terrific to see it all from the perspective of those who, not only did not fly, but didn't even know we existed. It is always good to have the community realise you do indeed exist and to teach them about all the things involved in what happens at an airfield.

I cannot wait until our next foray into Fly-Ins in two years time.

Debbie Steward with Ivan Dean and Debbies' Skyfox Gazelle

Fly-Ins Are Fabulous

BY KEVIN MC GRATH

The annual Clifton Fly-In is done and dusted. And as I reflect on a great weekend, I recall how the preparation by club members got busier the closer it got.

Trevor Bange and the Bange family, owner of the airstrip and our CFI, would write the jobs to be done on the whiteboard. As the jobs were completed and removed he just kept replacing them (about three times over I am sure).

Over 120 planes, three gliders, a number of old cars, especially Holdens and a glorious assortment of planes, 12 motorbikes, numerous vans, mobile homes etc. and tents as thick as mushrooms, all guaranteed a great day. Thirty five planes arrived on the Saturday and there were ninety guests for dinner.

The marketing slogan 'beautiful one day, perfect the next', proved true for this part of Queensland. We had clear skies, light winds with moderate temperatures.

To me, the iconic image of the day was a Drifter slowly cruising above the field at about 4,000ft, backlit with the brilliant sun and in a cloudless azure blue sky. It's brilliant yellow outline of wings, contrasting with a darker shade for effect, made the group of us watching sigh with admiration.

The aircraft assembled into five long lines. It takes a lot of energy to walk and inspect each one and have a yarn to their owners, something you cannot do at air shows and many other similar events. But I cheated, because Keith Bange (brother of Trevor) was there on a big quad bike, fully fitted with large safety water spray tanks. I hitched a ride and inspected the long lines of aircraft in comfort. We were a mite surprised when one gentleman asked if we were the mobile refuelling team.

On Sunday morning I noticed five planes in the circuit with one Lone Ranger doing a contrary circuit which was soon corrected by the ever observant team. We also had the red Just Aircraft demonstrate a short take-off landing. I've seen choppers use more runway than he did.

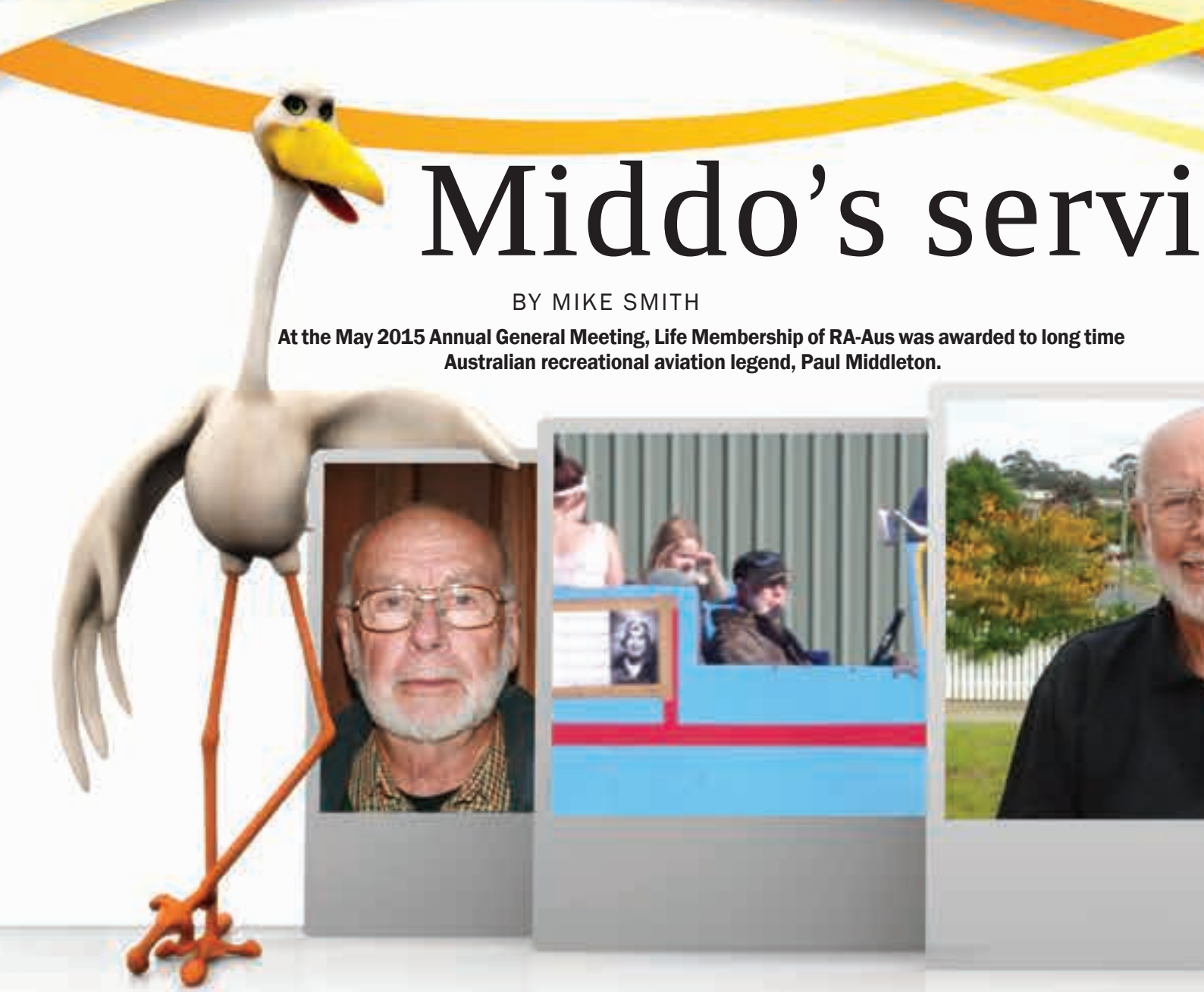
The question and answer session by the RA-Aus CEO and Board members was greatly appreciated and it is good to see them getting out and about to talk and meet with members. It was greatly appreciated by all. I was surprised there were not more questions from the floor. It shows the membership in general must be happy with the direction our movement is currently headed.

So, after all the excitement, my advice to all is this. Book in now for next year- dinner, bed and breakfast. On second thoughts, best bring your own bed.

Middo's servi

BY MIKE SMITH

At the May 2015 Annual General Meeting, Life Membership of RA-Aus was awarded to long time Australian recreational aviation legend, Paul Middleton.



Middo began flying training in 1961, which means he has been involved in aviation for 54 years - so far.

He was an aviation enthusiast from the time he was a little bloke - he had a number of close relatives serve in the RAAF during WW2, which no doubt fueled the fire. He attempted to join the RAAF himself when he was 18, but was only offered the option of Wireless /Air Gunner or Navigator, neither of which interested Middo, who only wanted to be a pilot.

Having left school in 1955, he spent his first working years in the family general store, a great grounding in things practical and commercial. But the flying bug wouldn't go away and in 1961, he headed for the gliding club at Camden aerodrome. After an afternoon of being ignored and watching some very interesting cable launches, Middo started to reconsider his decision.

Heading home dejectedly, he walked past the hangars and was given a hoy. A local Apex acquaintance was waving at him. A cup of tea later he was hearing all about the aspirations of the newly formed Camden Aero Club. A fortnight later he was strapped in the seat of a DH82a Tiger Moth doing his TIF. He was hooked! For the princely sum of four pounds an hour, our valiant hardware salesman earned enough to afford an hour a fortnight. Middo's justification for spending the money was that flying would be a great way to go hunting and fishing. Strangely they ceased to be any sort of a consideration.

Middo gained his commercial licence in 1966 and his instructor rating, courtesy of the Camden Aero Club, in 1967. He immediately began instructing part time at the club. By this time it was obvious the day of the country general store-selling everything from groceries, gas stoves, building materials, shotguns, through to truckloads of wheat and chook food-were a thing of the past and by mid-1968 Middo was instructing full time.

These were the Vietnam War years and a golden age for aviation in Australia. At one stage there were 13 flying schools at Camden Aerodrome and Bankstown Airport had the highest number of aircraft movements in the Southern Hemisphere.

By the end of Middo's second log book in 1970, he listed 25 different aircraft types, ranging from a DH60 Gypsy Moth, which had originally been owned and flown by Charles Ulm, to a Twin Comanche. After a stint at a charter company and various flying schools as Chief Pilot, in 1978 Middo gave away the fun and joined the Department of Transport as an Examiner of Airmen in Vic/Tas region, looking after the flying schools. He was there and in Canberra for 17 years, finally ending up as Manager of Standards Development Branch.

In 1989 he attended a seminar in Oshkosh on the birth of the present LSA system. Five years later he was involved in a taskforce which paved the way for certification of Australian built ultralight aircraft, something opposed by elements within the Department.

Enter the AUF

Middo joined the good guys in August 1994 as Ops Manager. Before his arrival there had been a huge amount of infighting in the AUF and membership was down to about two and a half thousand. In 1996, the Board appointed Middo as Executive Director on top of his role as Ops Manager.

ce recognised

At the time the AUF was looking forward to the introduction of the Experimental Category which had been in the pipeline for 30 years. Middo had been heavily involved in this during his time in CAA and it was a simple hat change to be involved again. At that time there were numerous stories of difficulties in homebuilding. Under the existing system, someone who built more than one aircraft had to have their premises inspected each time. If you were in the back blocks of South Australia it was a huge cost. Professional welders were not allowed to weld their own airframes and attempts to gain approvals were blocked by the bureaucrats. Middo recognised the opportunities for the AUF and pushed the new system. The move to Experimental saw a surge in AUF membership and aircraft registrations.

Also in 1996 the Minister for Aviation announced a major review of aviation legislation. Middo and the AUF were in the thick of it and spent thousands of man hours to try and get legislation through. It lasted for twelve years until it was put aside and all the progress wasted when there was a change of government and a new CASA CEO appointed.

On another occasion CASA decided AUF schools should hold Air Operator Certificates and operate to the same requirements as GA schools. This would have imposed huge costs on our schools and seen many of our one-man operators forced out of business. Middo argued such a move would be a safety disaster for the AUF as the schools were our main means of physical contact with the members. This battle went on for some time and culminated in AUF members blockading an aircraft carrying the Minister when he arrived at a northern NSW regional airport. The Minister listened to the AUF case and sanity prevailed. Over the years, Middo was able to use our accident statistics to prove that whenever the Authority allowed us a weight increase, it resulted in better aircraft, more 4 stroke engines and a resultant decrease in the accident rate.

During the GA years, Middo had been involved in an air race which overnighted in Narromine. Over the years he had harbored the idea of an airshow at the venue. OCTA, huge open fields and west of the divide. When Board member, Howard Loundes, approached Middo for support to hold a National fly-in at Narromine, he jumped at the opportunity to bring the dream to reality. Middo has never missed a NATFLY.

As Executive Director working closely with the Board, Middo helped our organisation grow at the time of his retirement in 2007 to around 8,000 members. He managed the name change of the organisation from AUF to RA-Aus and was the mover and shaker in acquiring our own premises. He is a staunch believer that we are a national body and belong in the national capital. He believes moving away from Canberra would be a retrograde step. Following his retirement Middo served three terms as a Board member including a period as Secretary. He is still active as an instructor and a Regional Ops Co-ordinator and is finally in a position to go shooting and fishing.

In presenting Paul Middleton with Life Membership, RA-Aus acknowledges his invaluable contribution to the organisation and thanks him sincerely for everything he has done to establish, develop and promote recreational aviation in Australia. Thanks Middo.

Babylon to Avalon

BY MAURICE LLOYD

The magnificent Northern Rivers region of NSW with its sub-tropical climate, gentle flat plain country and mighty rivers, lends itself to the title of Babylon.

It was from here that we set sail in February in Gary Faulk's Auster J5G Super Auto Car for an epic journey south to Avalon. We departed YBNA at a reasonable time of the morning and climbed to 5,000ft to get over the patchy cloud and the tiger country over the mountains towards Tenterfield.

Then it was on to Gunnedah to refuel, Forbes and then Narrandera for our overnight stop. We decided to refuel before we put the old girl to bed for the night. Narrandera has a modern refuelling point, all the mod cons, but when I pulled the hose out to refuel, we noticed a bloody snake, about 1m long, nicely curled up next to the side of the delivery hose. By the time I got my feet back on the ground and let out a bloody great yell, Gary had already disappeared and in doing so knocked the HAZCEM shower off its bracket.

We decided the shower repair was a job better left until next morning so we said good night to the snake and put the Auster to bed hungry.

Back at the airport the next morning, I took a wide birth around the refuelling pump and bugger me the bloody snake was still in the same spot. I was starting to think something was a bit fishy and had just decided to take a closer look, when one of the locals arrived to find out what all the commotion was about. He showed us the snake was a plastic one. A local joke.

With many smiles we headed off to Tocumwal, then via Shepparton to Bacchus Marsh and Wooloomanata - a couple of cross strips in a wheat paddock - where we met the owner Mr Pettit then waited for the final briefing for the last leg via Barwon Prison to Avalon.

We struck out at 5pm and were parked in display position at the air show an hour later.

Great organisation at the show. We were picked up by the bus, all voluntary drivers, and driven to Lara camp ground where we pitched the tent - no mattresses for us, just sleeping bags - a meal then into bed at end of day two.

Was the ground hard? You bet. I'm 83 years old and I felt every blade of grass. But we would be okay as long as the weather held.

For the next three days we enjoyed the hospitality and friendship of the A.A.A.A, RA-Aus and VAAA, all providing us with super places to view the proceedings and watch the spectacular aerial displays.

But it had to happen. Saturday night about 5pm, a thunder storm hit just as we were finishing dinner. It came down heavy and made a dry trip back to the tent seem impossible.

Gary made a dash for it. I followed more slowly and we both arrived equally wet. Despite a change into dry clothes and an early night into the sleeping bag, the rain and wind didn't stop for most of the night. Everything, including our sleeping bags and the feet within were soaked through by Sunday morning. Fortunately, though, the storm had cleared the air for our departure.

We had a final day watching the air show, then headed back to the Auster to repack it with soggy gear. We had hoped to get away by 5pm, but despite a sign saying the refueller would be available at 12, it was nearly 4pm by the time our tanks were replenished.

We took the opportunity to change a couple of spark plugs on one side, to make the old girl go a little better. Before you know it, and only half an hour behind schedule, we were lining up to make our dash along the taxi way, pushed out to starting point, carbie primed, hand cranked and the engine burst into life to start our journey home. There was a 30kt southerly blowing, so on our way back to Tocumwal, our groundspeed reached a healthy 105kts.

The next day our flight proceeded to plan, we even had a slight tailwind for most of it up at 5,500ft. From Gunnedah, where we refuelled ourselves and the Auster, we set off for the final leg. All was fine until we were abeam Tenterfield and about to proceed over the tiger country to Casino.

The cloud began to close in. The ceiling was still pretty high, but it took some very fine manoeuvring by Gary, through the valleys and a glimpse of Baryugil Airfield, dancing in the sunlight, until we managed to come out the other side just to the south of Casino airfield. By then it was getting pretty murky. Showers started springing up in our path. We aimed south of Ballina to get to the coast, then we sat over the ocean for a while until it cleared enough for us to get into the circuit and touchdown at 5.20pm. Absolutely magnificent.

The Auster at Avalon

Gary ad Maurie living it up

Total distance:	Fuel:	Time:	Oil:
1,498nm	545 Litres	995 Min	6 Litres

The Narrandera snake

FK9 ELA WB

The first production LSA with diesel power

Extra room and range for touring, with payload and economy to keep you smiling.

Your ideal travelling companion, with any conventional Rotax 912, or the new Turbo Diesel power, running on Pump or Jet A diesel.

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RA-Aus is the path to RPL

BY PAUL MCKEOWN, **THE RECREATIONAL FLYING CO**

There has been argument among RA-Aus members regarding the new CASA flight crew licencing system, or Part 61 of the Civil Aviation Safety Regulations. Not surprising because everyone – including the regulator - is still coming to terms with the detail of the changes.

One of the signature pieces of the new legislation was the introduction of a Recreational Pilot Licence. Since the early 1990s, CASA has been without a local area Pilot Licence below full PPL. The General Flying Progress Test (GFPT) was a pseudo approval but never really a proper licence. The introduction of the RPL has now closed this gap. Additionally, CASA has also taken introduced four new endorsements that may be added to the RPL, specifically:

- Recreational Navigation
- Recreational Radio
- Recreational Controlled Airspace
- Recreational Controlled Aerodrome

Pilots holding the new RPL licence may also undertake training to qualify for design feature endorsements such as:

- Tail Wheel Undercarriage
- Manual Propeller Pitch Control
- Float Plane
- etc.

NOTE: Nothing has changed in terms of who can fly aircraft of different registrations. You need an RA-Aus Pilot Certificate to fly RA-Aus registered aeroplanes and you need a GA Pilot Licence (this includes RPL) to fly a VH registered aeroplane.

The fact the RPL so closely resembles the RA-Aus Pilot Certificate should be a matter of great pride to the RA-Aus. The only sticking point is that CASA has given its Recreational pilots the option of CTA/CTR endorsements (something they have never let the RA-Aus have!).

Further kudos to the RA-Aus is that in Part 61, CASA has recognised the RA-Aus Pilot Certificate as an equivalent standard to the RPL. There is a process for RA-Aus pilots to convert across to the new RPL qualification that looks as simple as filling in a form.

But looks can be deceiving.

Converting an RA-Aus Pilot Certificate to RPL actually involves a series of complicated steps which must be done in the right sequence if you want CASA to process your application and to ensure you are legally compliant when you get your new licence.

One of the quite valid criticisms of Part 61 is that it is written in very complicated legalese, is disjointed and often applies rule by the omission, rather than inclusion of detail. This makes it a very hard document for the average pilot to read.

To help understand the process then, here is a summary of the steps to convert your RA-Aus Piot Certificate to RPL.

STEP 1 ARN APPLICATION

To get into the GA world, you are going to need an Aviation Reference Number (ARN). Use CASA form 1162 and get this away as soon as possible because you won't even get a medical without an ARN. CASA will send you your ARN in the mail.

STEP 2 ASIC APPLICATION

If you already hold an ASIC issued by the RA-Aus – you're lucky and can skip this step. Otherwise read the following:

You won't find any reference to ASICs in Part 61, but the Transport Security Regulations require CASA to do a background check on you (this used to be done on CASA's Student Pilot Licence form but CASA dropped their Student Licence, so now it can only be done with the ASIC application or the alternative AVID (Aviation ID). As more and more aerodromes (security controlled or otherwise) require ASICs, this card is really the best option. Use CASA form 498 and get this away, with all the required documentation, as soon as possible.

NOTE: An important document often overlooked is a CASA requirement for a letter from your flying school verifying that you need an ASIC for flying purposes! Don't forget this item as your application will be returned unprocessed – often after many weeks delay!

NOTE 2: You don't need your ASIC to commence training, you only need to have applied.

STEP 3 MEDICAL

You have the option with the RPL of doing a CASA class 2 Medical or getting a Recreational Aviation Medical Practitioner's Certificate (RAMPC) from a GP.

NOTE: This is not like the RA-Aus where you just verify you have driver's licence medical standard – Both the class 2 and the RAMPC require a visit to the doctor.

If you decide to go for the RAMPC, you need to get the extensive form 166(A)(B)(C) and take it with you to the GP. If you pass the medical, the GP will complete the certificate which you send to CASA, which will send you a notification of receipt. You must carry both your RAMPC and the CASA receipt with you when you fly.

RAMPC certificate holders are subject to the following limitations:

- Limited to carrying 1 passenger only;
- Limited to flight not above 10,000ft;

Unless accompanied by a safety pilot.

When you look at form 166 you will realise it is almost exactly the same as a class 2 medical in terms of the requirements. So if you can't pass a class 2 - you may also struggle getting through a RAMPC.

Also, under the class 2 system, certain conditions may be allowed after your DAME and CASA look at specialist advice etc. If you fail anything on the RAMPC, the doctor cannot sign the certificate. All said, the class 2 really is simplest and the best option for unrestricted use of your RPL. Though you will need to pay the CASA medical fee as well as the doctor's fee.

To do a class 2 medical you will have to go to a DAME .

NOTE: You must have a medical to fly solo in a VH registered aircraft and exercise the privileges of your RPL. Processing can take time so get this done as soon as possible.

STEP 4 ENGLISH LANGUAGE PROFICIENCY

CASA has adopted the ICAO requirement to assess English language proficiency for holders of flight crew licences. This includes the RPL. English Language testing seems ridiculous for native English speakers but unfortunately a 'one-size fits all' approach is taken.

Continue page 28

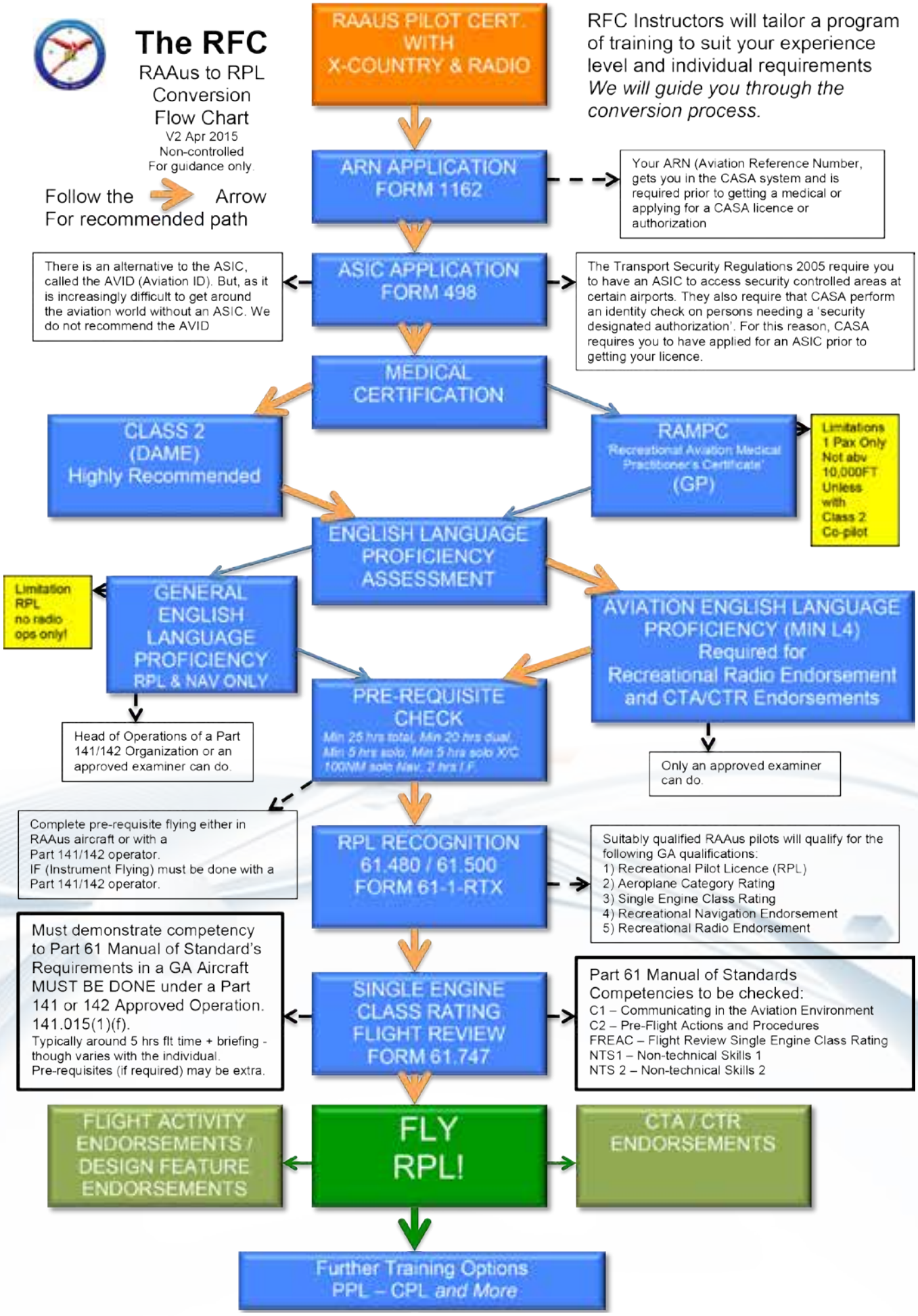
The RFC

RAAus to RPL Conversion Flow Chart

V2 Apr 2015
Non-controlled
For guidance only.

Follow the → Arrow
For recommended path

RFC Instructors will tailor a program of training to suit your experience level and individual requirements
We will guide you through the conversion process.



There are two types of English Language Assessment used by CASA. General English Language (GEL) and Aviation English Language (ELP). GEL can be done easily by a Head of Operations (CFI) at a GA school, but ELP can only be done by certain specially qualified examiners (sometimes hard to find). GEL is all that is required for RPL and on face value, this looks great, until you realise that ELP is actually required for an RPL Radio endorsement. Therefore, unless you are going no-radio with your RPL (unlikely), you'll need to be tested to the higher ELP standard. You need to find an examiner who can do the test (your flying school will help here). The process takes about 30 mins and will cost around $140 for the examiner's fee.

STEP 5 PRE-REQUISITE CHECK

CASR 61.480 and 61.500 are the regulations which allow for the transfer of RA-Aus qualifications to RPL. However, having your Pilot Certificate is not enough. You must still meet the minimum requirements for RPL and RPL Nav in order to be processed. You may meet some, but not all of these requirements as an RA-Aus pilot, so it is important to check because you may need to do some additional flying or flying training. The requirements are:

- Min 25 hrs total (RA-Aus Pilot Cert. only requires 20);
- Min 20 hrs dual (RA-Aus has no minimum dual);
- Min 5 hrs solo (Same as RA-Aus);

And for Navigation Endorsement

- Min 5 hrs solo x-country (RA-Aus X/C only requires 2);
- Min flight of 100NM on a solo navex (RA-Aus has no requirement);
- Min 2 hrs Instrument Flying (Not available in the RA-Aus syllabus)

Make a list of what you need and complete it in an RA-Aus aircraft or before your flight review with a GA Part 141 or 142 flying school. (The Instrument flying must be done with a Part 141/142 operator).

STEP 6 RPL APPLICATION

This is the step where you obtain your RPL. But remember – even when you get the licence you cannot use it yet, because you haven't done a flight review. Use CASA form 61-1-RTX (caution, not 61-1TX). You will need certified copies of your RA-Aus Pilot Certificate, ASIC and logbook pages showing the required solo and navigation times. There is a $50 CASA fee for this application.

You will also need to fill in CASA form 61-9PIC and provide a certified passport photo of yourself (less than 6 months old).

NOTE: There is a section on form 61-9PIC which must be signed by the person certifying the photo so take the form with you to the JP (or equivalent).

STEP 7 FLIGHT REVIEW

You can't use your licence until you have a current flight review (required every two years). If you look in Part 61 it doesn't say anything about an RPL needing a flight review. This is because a flight review is not required on your licence but on your Class Rating. This point is easily missed but critical to understanding Part 61. You see, when you get your RPL you will also be issued with an Aeroplane Category Rating (as opposed to helicopter/balloon etc) and a Single Engine Class Rating. You must have at least one Class Rating and it is this which needs a review.

So what's involved?

Your Class Rating flight review must be done with an appropriately qualified GA instructor who is working for a Part 141 or Part 142 GA flying school. It must be done in a VH registered aircraft but is otherwise simply a competency based review. Under the new system, your instructor needs to find the required competencies for the flight review in the Part 61 Manual of Standards. You can go to the MOS yourself and look at them, but for a SE Class Rating, they are:

- C1 – Communicating in the Aviation Environment;
- C2 – Pre-Flight Actions and Procedures;
- FRSEAC – Flight Review Single Engine Class Rating;
- NTS1 – Non-Technical Skills 1;
- NTS2 – Non-Technical Skills 2.

Each unit has a number of elements eg: FRSEAC has things like crosswind take off, forced landing, low level flying at 500ft, stalls etc. Specific completion standards need to be demonstrated in each element for you to be deemed competent. Depending on your skill level and experience, you may need some training to meet a particular competency. If it is the first time you've flown a GA aircraft you may also have come to terms with handling a heavier, more complicated aircraft. Your flying school has a legal obligation to ensure you meet MOS competencies before signing for your flight review.

Our flying school has been doing a lot of RA-Aus to RPL conversions and experience is showing that getting an RA-Aus pilot up to flight review standard in GA takes about five hours (seven if they need the two hours of Instrument time). This, we do on either a Cessna 172S or a Citabria tail dragger. Obviously, you could do your RPL conversion on a GA registered Jabiru or Tecnam and maybe get your flight review done in a single flight...but have you really done a GA conversion?

You would still need to budget for the conversion time if you ever wanted to fly anything bigger. But that's a choice you can make. Interestingly, up until the release of the new RA-Aus Ops manual, the minimum time to convert a GA pilot to RA-Aus was set at five hours, and I always found this to be about right.

The good news is you won't need to do any additional theory exams and your Nav and Radio endorsements will come with you. Subsequent flight reviews for your RPL should be easy (providing you maintain your competency).

NOTE: It is important to know that Part 61 only allows for the transfer of Nav and Radio endorsements. Other design features will have to be added by a GA instructor after a demonstration of competency. If you want to put the CTA and CTR endorsements on your RPL, you will need to do additional training and pass a theory exam.

Once the Flight Review is completed, your instructor will sign for it on your Part 61 licence, and providing you've got your medical – you're good to go!

Not quite as simple as the glossy brochure for Part 61 implies,eh?

So is it worth it?

Make no mistake, the RPL is an excellent product, and will be a very popular (and useful) qualification for both GA and RA-Aus pilots alike. In fact, an RPL with Nav and CTA/CTR endorsements used by a pilot holding a class 2 medical pretty well gives the user PPL level capability on aircraft up to 1500kg (without having to do the dreaded PPL exam). For RA-Aus pilots converting across, the RPL provides access to a whole range of faster, more capable aircraft, extra passenger seats and controlled airspace.

RA-Aus itself should have nothing to fear from the RPL. In fact, if anything – it should make us stronger. It is still far cheaper and far better going RA-Aus before RPL. Part 61 also, for the first time allows all of your RA-Aus hours to be counted towards a CPL (non-integrated course), and that's a big win.

The extremely high cost and complexity of GA maintenance, operations and regulatory compliance will continue to ensure RA-Aus is a very attractive alternative for people who want to enjoy easy, fun and uncomplicated flying in an atmosphere of camaraderie and mutual benefit.

So yes, RPL is definitely worth doing, but as you can see from the above conversion, 'Thank heavens for the RA-Aus!'

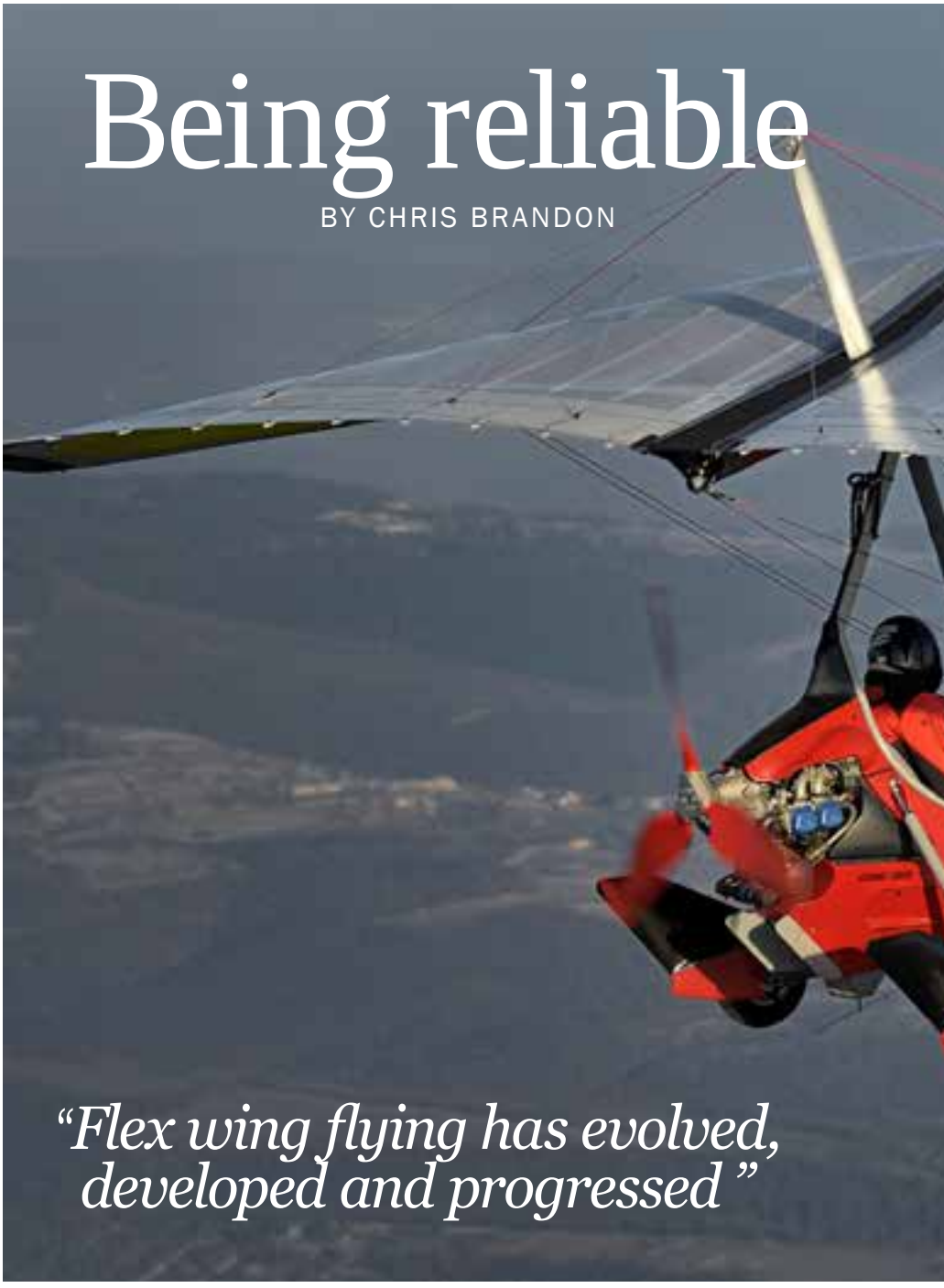
Tanarg on its maiden flight in Alice Springs

BioniX 13 wing at zero AOA - DULV testing - Germany

Nepalese student, Tulsi, with Peter McLean, YFT training ops

Being reliable

BY CHRIS BRANDON



"Flex wing flying has evolved, developed and progressed"

Some years ago, amid my travels of youth, a very common sense older tradesman, deep underground on the night shift, in a pitch black Hunter Valley coal mine, offered this apprentice sound and simple advice.

"Always be reliable", he told me. That advice is still embedded in my mind four decades on.

The Oxford says reliable means 'of consistent good character or quality. Dependable'.

Dependable wasn't always obvious in the old days when a few of us flew primitive delta tow kites behind ski boats or launch off hills in hang gliders.

Nor was it always evident in the 1980's when extra tubing airframe bits in the kite, an engine, handmade props and three wheel undercarriages meant we could really blast off.

Back then it was a paddock out back (don't go above 500ft), landowner permission, stay away from airports. Wow, but it was cool.

Today, we trike pilots fly into airports, we fly navex journeys, conduct formation flights and go places. And we are accepted by other aviators as real pilots in real aircraft.

Flex wing flying has evolved, developed and progressed. It's also meant we have had to become more reliable.

Trikes themselves have evolved. They remain largely open cockpit, transportable and easy to fly. But ultimately, pilot and passenger comforts, combined with variable wing geometry, engine performance and the need for safety have become benefits measured with reference to affordability.

With evolution has come regulations – compliance standards, acceptable standards, first of type standards, LSA standards or, as we have in Australia, applicable standards in accordance to CAO 95.32.

A significant issue with all these standards - which is reliably repeatable by manufacturers? And are trike manufacturers delivering safe machines for us to fly? Can we presume to fly the invisible atmospheric conditions with higher speeds, increased payloads, better handling and safer journeys?

One significant factor to all kite wing technology is pitch stability. The aircraft flight tumbling moment is always a factor with flexwings. Without a tail like conventional aircraft, weightshift aircraft such as trikes rely upon reflex stability / wing twist

Egypt Military Police Aircraft with SAT Image Equipment

Petaluma trikes on bivouac flight - Aubenas

control, to substantiate aircraft longitudinal stability and provide positive attributes in spiral dive recovery.

Since 1986, the German – DULV Pitch Rig has been used worldwide to significantly confirm the aerodynamic stability of tested flexwings, beyond the normal flight envelope. The DULV test crew, inside the truck fitted with computers, cameras and lift lobe feeds, can vary the hydraulics on the rig to alter the Angle of Attack. Under test conditions, a wing can be pitched below zero/negative or above positive, to provide reliable evidence of lift co-efficient, twist characteristics and control bar pressures.

Most European light sport aircraft companies test their flexwings this way. Expensive for the manufacturers, but vital to provide their customers with a guarantee of reliability.

Trike wings are not pure kitewings anymore. Today we fly with such innovations as faired tubings, strut braced wings, variable geometry configurations and electric CG trim. The undercarriage has evolved from round tubing to square, to rectangle, to chrome moly construction and aerospace tubing in many machines. Engine mounts have gone from simple rubber supports on the lower crankcase to intuitive cradle configuration/vertical mounted – similar to general aviation aircraft.

Pilots of trikes now fly long navigation flights, stay over-night and continue their journeys across a vastness unheard of in those early days. And it all comes down to what that miner told a younger me all those years ago – always be reliable.

BioniX 13 Skypper 912s factory flight test - France

Quicksilver

like hotcakes and bagels

BY BERT MOONEN

The High Tailer which evolved into te original Quicksilver design

David Cronk flies the original Quicksilver No 1

In the US, back in the days when ultralights were in their infancy, pioneers like Dave Cronk and Dick Eipper began experimenting with rigid wing hang gliders. They were dramatically different from the pointy-nosed (high aspect ratio) Rogallos which dominated the hang glider scene at the time. Cronk and Eipper's design had a rectangular wing and a conventional tail, complete with a horizontal stabiliser and a movable rudder. (The two men were widely considered at the time to be hillbillies with a death wish.)

Eipper decided to set up a business to promote their design, which turned out to be a good move, because with good marketing, the business leaped ahead of the garage-builder crowd and never looked back. Cronk in his Quick C fast became a legend around the traps. The C model, with its crisp, all-white Dacron sail-cloth wings and tail, set off by a sparkling airframe made entirely of bronze-anodized aluminum tubing, always drew admiring glances from the crowd.

This was the early weight shift Quicksilver (which, by the way, you can still get parts for). That iconic wing/tail design had excellent performance, but it also had some shortcomings: It was too stable and didn't turn well.

The company redesigned the tail and emerged with the Quick A. It used the same 30-foot-span, 4-foot-chord wing. But in place of the twin vertical tails was a horizontal, A-frame tube arrangement angling back from the trailing edge. A cable-braced, fixed horizontal stabiliser and rudder finished off the new fuselage. The rudder was moved by lines fixed to either side of the simple plastic swing seat.

Qucksilver GT500-912

Because the trailing edge of the rudder's C-shaped frame was unsupported, the rudder distorted a lot. It was still effective at yawing the tail enough for the dihedral of the wings to come into play and effect a turn. A stiffer D-frame rudder solved that problem.

The designers kept tweaking. Load testing uncovered weakness in the trailing edge, which was fixed.

The B model debuted, ready-to-fly (for all of $965, twice that of a Rogallo) and sales took off.

Before long, a new C model debuted. It had an increased span of 32ft, a deeper chord (to 5ft), a larger tail and the airfoil camber was reduced from 12 to 8 per cent camber.

For a few years in the 1970s, the Quick was the top performing hang glider. In time, other rigid wing designs, including the Icarus II and V, Manta's Pterodactyl Fledgling and ultimately Rogallo flex-wing designs themselves, began to challenge, then eclipse Quick's reign.

Eipper saw the writing on the wall and decided it was time to introduce an engine to their creation. While some die-hard souls hung power units on flex wings, the Quick's conventional aluminium frame offered the best platform for motorised flight.

The company had changed hands many times over the years and a new group of investors figured a powered Quick would sell like hotcakes.

A Texan car salesman bought the company and renamed it Quicksilver, and yes they did sell like hotcakes.

The first powered Quicksilver was the model E.

Quicksilver

like hotcakes and bagels cont.

It sported the classic weight-shift sling seat, but now included a cranky McCulloch MAC-101, 12hp engine with a V-belt reduction drive, pusher prop and all of 1.7 gallons of fuel. It still had to be foot launched (the FAA hadn't yet evolved the regulations to accommodate wheel launching).

The first production powered Quicksilvers had a much more reliable 15hp Yamaha engine. There was a spring-loaded throttle on a down tube, but the landing gear was still the pilot's legs. It cost $3,995, a tidy sum in those days, but for a complete airplane, it was a bargain. And you didn't have to carry it to the top of a hill to launch. Before long it became clear the Quick would surpass even the company's original vision – more than 15,000 sold and still counting.

New models were developed, including the Quicksilver MX, which evoked the company's desire for three-axis control instead of simplified two-axis (weight shift for pitch, rudder for yaw-roll coupled banking). The first MX (for multiple axis) had a movable elevator for pitch and, because pilots asked for true three-axis control, they tried spoilers on top of the wing. It was not really 3 axis in the true sense, because the spoilerons took lift off the wings.

Quicksilver Sport 2S

Quicksilver GT400

Quicksilver MXL2

"The designers kept tweaking"

Next came ailerons and that did the trick: The Quicksilver was now a three-axis aircraft. The new model, the MXL (L for aileron), sold like hot bagels.

Quicksilver transformed its success into an expansive dealer network and new models. For training the company created a two-seat Quick. These existed in a quasi-legal grey area. They were too heavy for the ultralight category and carried two people. The FAA let them pass as trainers, but many pilots actually used them for two-person recreational flying.

When the sport pilot rule came out in 2004, two-seaters could be grandfathered in as experimental light-sport aircraft (E-LSA), with proper inspection and some paperwork. Two-seater ultralights could then be registered as experimental amateur-built (E-AB) and used for ultralight training...as long as dealers didn't charge for it.

Quicksilver then introduced the GT line, designed by Dave Cronk and Tom Price. The enclosed cockpit, double-surface-winged, three-axis single-seat GT 400 was a legal ultralight. The later two-seat GT 500 was too heavy and fast for the FAR 103 category. It was offered as an E-AB kit or ready-to-fly airplane (Sportplane Class) in the new FAA category of Primary Aircraft.

The company was sold again in 2012 to Will Escutia and Dan Perez. They renamed it Quicksilver Aeronautics. Escutia is the president; Perez oversees operations at Quicksilver HQ in Temecula, California. The new management team has big ideas for the future. They inherited a company only producing kits and struggling. In less than three years, their re- energised Quicksilver Aeronautics has made significant strides.

The company's Sport 2SE two seater was recently awarded S-LSA certification in the US.

"Our principal idea for going the S-LSA route was two-fold," says Escutia. "We want to give non-builders a ready-to-fly, affordable airplane. And we want to grow our dealership network by giving them an aircraft they could legally train in and be able to charge for that training. We also want to help them increase profits by providing them with E-LSA kits that they can either sell outright or build for their customers."

E-LSA kits do not have the same restrictions as E-AB kits: They can be built almost entirely by a dealer. The Sport 2SE-LSA will be available in Australia though Quicksilver Aircraft Australia from around June.

As for me, I started to get interested in learning to fly about the same time Quicksilver introduced the MXL.

I looked at what was available in the ultralight market and Quicksilver kept coming to the top of the list. The dealer at the time was based in Forster in NSW and was selling probably only two or three kits a week (I wish it was like that today). I didn't go ahead with my dreams to buy one then. It wasn't till I turned 50 and the kids had all grown up and moved out, I realised I had the spare dollars to follow my passion.

Despite the intervening years, my desire for Quicksilver hadn't waned. The first aircraft I bought was a GT400 single seater, which I put many hours on. Later I graduated to a two seat GT500. When the chance to represent Quicksilver in Australia came up, I grabbed it and the relationship has grown stronger since.

Quicksilver was one of ultralight's pioneers. With its new models, new attitude and vision, Quicksilver is also well placed to be central to its future.

DESIGNnot

DAVE DANIEL

Keepin' Cool

Thanks to the millions of dollars spent on marketing by the world's car manufacturers, you could be forgiven for believing the modern internal combustion engine is a marvel of efficiency. And while it's hardly a secret most aircraft engines are not quite at the cutting edge of engine technology, it's not unreasonable to assume they do a half-decent job of converting fuel into motive power, is it?

The suprising reality is that internal combustion engine efficiency numbers are far from earth-shattering. Of all the energy released by burning fuel in your engine, a scant 28% or so actually gets delivered to the prop flange as useful work. To put this in context, an 80hp Rotax 912, running flat out, is liberating energy from its fuel equivalent to around 285hp; posing the obvious question, "Where is the other 205hp going?"

As you have probably guessed given the title of this article, the answer to the above question is heat and lots of it. The rule-of-thumb is that around two thirds of this waste heat disappears straight out of the exhaust, with the remainder soaking into the engine-requiring us to find some other means of disposing of it. On this front, ultralight engines divide into three categories, air cooled (e.g. Jabiru), liquid cooled (e.g. D-motor), or a mixture of the two (e.g. Rotax).

Despite these distinctions, it's worth noting all aircraft engines are ultimately air cooled. Liquid cooling simply provides a convenient way to relocate waste heat to a location where it can be transferred to the air.

Air is fantastic for flying around in but, thanks to its low thermal capacity and poor thermal conductivity, it makes for a rubbish coolant – an unfortunate fact given the quantity of waste heat to be disposed. All is not lost however and air does have a couple of properties working in its favour.

Firstly, it has low viscosity. Secondly, there is plenty of it – combine these two properties and we can relatively easily route huge amounts of air through our cooling systems. To give a grasp of the quantities involved, the previously mentioned Rotax 912 at cruise power will flow roughly 60 litres of liquid coolant through its radiator each minute. During that same period it will have passed more than 30,000 litres of air!

So it's clear we need to flow massive volumes of cooling air, but how are we going to do it? The simplest approach is to put the engine outside the aircraft, but this introduces a huge amount of drag and doesn't actually provide optimal cooling. To illustrate - in a US government test, the addition of a NACA cowling to the radial engine of a Curtiss AT-5A biplane not only increased its top speed by over 16kts but improved its cooling performance as well. So it's clear that for optimum performance a more refined approach is required.

Effective transfer of heat between a solid surface and a gas requires a large contact area and plenty of turbulence - to bring the maximum possible quantity of cool air into contact with the hot surface. High flow speeds will maximise cooling but they also result in unacceptably high drag. Lower speeds on the other hand, increase the duration of contact between the coolant and hot surface, maximising the heat transfer to a given parcel of air and making more efficient use of the coolant. Low speeds also reduce cooling drag by minimising the frictional momentum losses from the air as it passes through the cooling system.

The best way to ensure the above conditions is to use ducting to control the speed and pressure of the cooling air as it passes through the system. This is achieved using a duct of divergent-convergent form and placing the

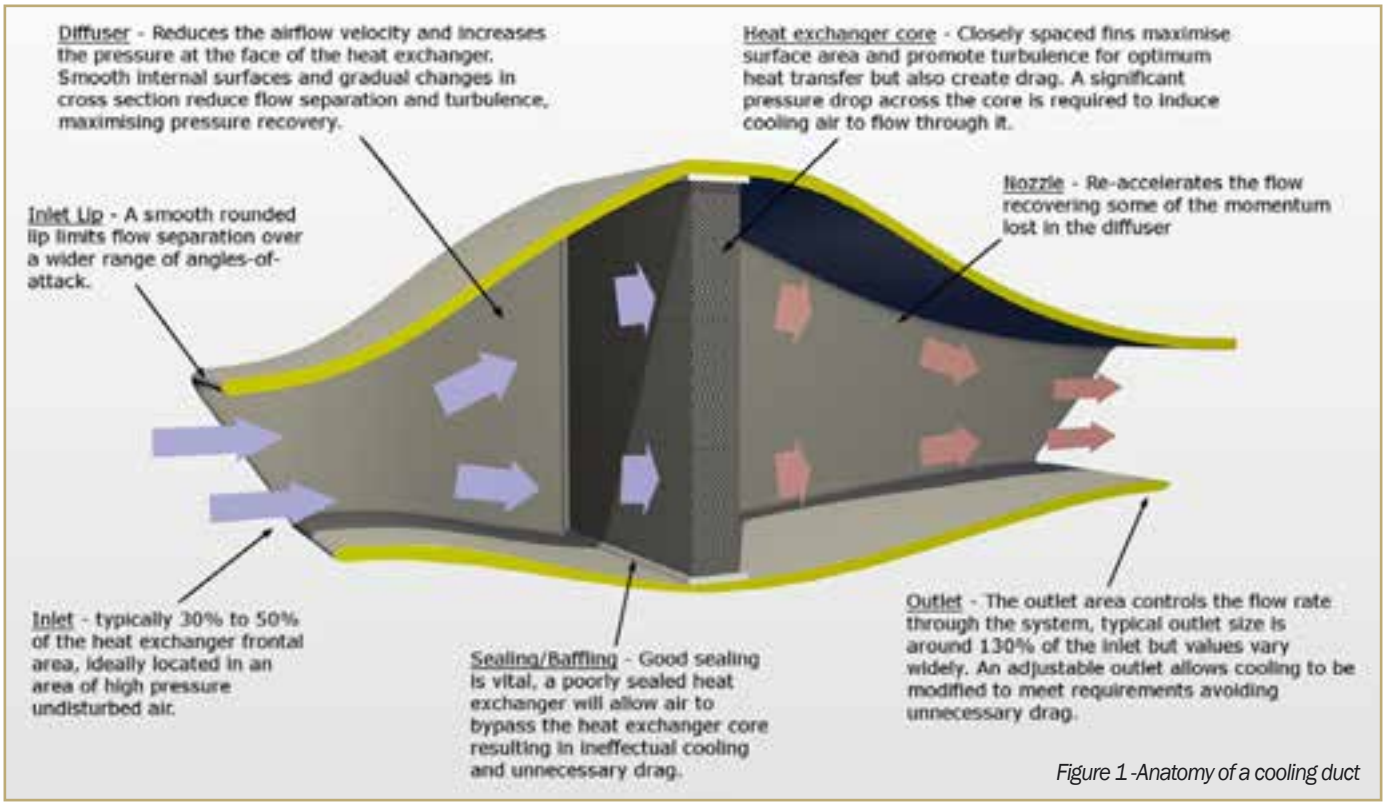
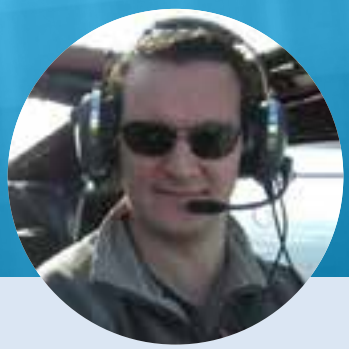


Figure 1 -Anatomy of a cooling duct



It's clear we need massive volumes of cooling air

heat exchanger (or the cylinders in an air cooled engine) in the widest section of the duct. The diverging portion of the duct, or diffuser, decelerates the air captured at the inlet, trading its velocity for an increase in pressure before delivering it to the front face of the heat exchanger. The heat exchanger with its closely packed fins forms an obstruction to the airflow, but providing the duct is well sealed a large pressure drop will develop across it, forcing the air through. By the rear face of the heat exchanger the cooling air will have absorbed a considerable amount of waste heat (and also gained some volume), but will also have sacrificed a significant amount of energy through friction drag and turbulence. To minimise system drag, behind the heat exchanger the duct converges again, re-accelerating the airflow and recovering some momentum before venting the cooling air back outside the aircraft at low pressure.

To maximise pressure recovery, the diffuser section needs to limit flow separation and turbulence, preferably collecting undisturbed air from a high pressure area and smoothly decelerating it through a gradual increase in duct cross section. Unfortunately this ideal requires a long duct, which is often not achieveable, especially in air cooled engines with only a limited space between the prop and engine to squeeze an inlet. As a compromise, a short inlet is often placed behind the outer part of the prop arc, allowing it to collect high velocity prop wash. While the resulting air flow is extremely turbulent, the high air speed is used to force air through the cooling system and is particularly effective for ground cooling.

On the subject of ground cooling, a fact which often seems to be forgotten is that hot air rises, so placing outlets above inlets is a logical arrangement. For this reason, placing an outlet on top of the cowl in the area of low pressure directly in front of the windscreen is tempting. Unfortunately with this arrangement, should a catastrophic engine failure or fire occur there's a good chance visibility will be lost, so downdraft cooling is more common than might otherwise be expected, at least for tractor aircraft. Placing the outlet location in an area of low pressure improves cooling by creating a larger pressure differential across the heat exchanger. It also helps ensure air will flow through the system in the right direction, but it doesn't necessarily provide the best drag performance, so a trade-off has to be made.

Cooling requirements vary greatly between phases of flight, with the most demanding conditions occurring while idling for long periods on the ground and when climbing out at low airspeed and high power. Increased cooling demands increased airflow and the system has to be able to flow enough air to cope with these conditions. But flowing large amounts of air at all times carries a large drag penalty so a means of controlling the flow is useful.

Unless the inlet area is really small (less than about 30% of the heat exchanger area) it will have minimal impact on the amount of air flowing through the system, meaning cooling can be effectively controlled by varying the outlet area using. Cowl flaps are the usual solution and those which extend out into the airflow have an added benefit in that they create an area of low pressure in their wake helping suck extra air through the system.

For weight and efficiency reasons, motors and their cooling systems are seldom designed to deliver maximum power continuously. Instead the thermal mass of the engine is used to soak up short periods of peak demand, based on the fact it will take time for temperatures to build up to dangerous levels. This allows the cooling system to be undersized for peak demand, only having the continuous capacity for high power cruise settings, saving weight and drag.

SIZE DOES MATTER

For water cooled systems the relative dimensions of the heat exchanger are important. Automotive style radiators tend to be shallow with large frontal areas. Their shallow depth improves ground cooling because they have low pressure drop, but the large frontal area causes problems with duct design and drag. Sloping the radiator at an angle can reduce installation issues but increases the internal drag of the system. In comparison, many WWII era aircraft used much deeper heat exchangers mounted either below the wings or in a cowl 'chin'. These are efficient in terms of drag at higher speeds (vital for a fighter plane) but gave poor ground cooling due to the large pressure differential required to get cooling air to flow through them.

As a final thought, it's worth noting that cooling design is still not an exact science and even modern commercial designs start off with an educated guess which is tweaked during flight testing to give the desired performance. For those of us without access to wind tunnels and cutting edge computer models, it's certainly advisable to design cooling systems which can be easily expanded.

Next Month: Controls

A Legend in the making

BY SCOTT HENDRY

"I caught the upgrade bug"

My wife and I fell in love with light airplane touring on the way back from Great Keppel Island. While we were there, one member of our flying group told me he intended to upgrade his aeroplane.

I caught the upgrade bug too. Over a period of months he and I went looking at aeroplanes, each with his own ideas of what represented the perfect design. The first aircraft we looked at seemed to fill the bill, but the build quality wasn't up to scratch and the dealer was uncommunicative. So the search continued.

My mate then opted for a Tecnam and my wife and I eventually fetched up on the doorstep of Ed Smith and Greg Doyle from Silent Wings Aviation. During our discussions with Greg, he mentioned a new model he had coming soon – the Legend. Would I be interested to see a picture of it? One look was all it took!

I don't know if I'm allowed to say so, but the Legend looked for all the world like a Cessna 182. When I think of light airplanes, my first mental image is of the high wing Cessna models. Their styling, especially the ones with the swept back tail are iconic to me. Here was an aircraft that looked like I expected an aeroplane should look, but without the expense of the real thing.

But there was a problem. The model is relatively new and there are none in this country yet. There's no way I would buy an aeroplane without seeing it in the flesh and getting to fly it. So to see one up close I had to go where there was one. That meant travelling to the factory - and that's in Europe.

The company which makes the Legend, Aeropilot, is in the Czech Republic. Prague is the nearest major city. You get there by flying a long time in an airliner and it doesn't cost as much as you'd expect. On the last point, Greg actually offered to help defray some of the cost of the trip. I took him up on his offer and set off for Europe on very short notice.

Twenty seven sleepless flying hours later I was in The Czech Republic; my first time in Europe. I overnighted in Prague to catch some sleep and set off by train the next day for a small town called Časláv. (pronounced "chaslaf" where the A's sound like "ah").

When I got off the train, I was met by Lucie, Aeropilot's international sales rep. She took me to the factory to see the production facilities and meet Jaromir, the Managing Director, who also happens to be her father.

The production facility was pretty much what I expected it to be and they do their composite layups and processing in the way that all the better manufacturers do it. All standard stuff for composite aircraft parts these days.

I wanted to see and fly a finished aeroplane. Off we went to the airfield at Kolin (pronounced "co-leen"). At the airfield, they had a demonstrator aircraft and a new aircraft which was being flight tested before shipment to its new owner in Germany.

I won't go into depth about how it flies because I'm not a good enough pilot to rate it.

Besides which the aircraft performed so differently from anything I'd ever flown before that I wasn't able to judge it. However, the publicity claims the Legend has good flying qualities and that was backed up by Ed Smith's assessment of it. He flew it when he visited the factory and gave it very high marks for ease of handling and predictability.

What I do want to relate, though, is the outstanding quality of the fit and finish of the build.

The Legend is available in two models; the 540kg version for the European market and the 600kg LSA. The entire airframe is made from carbon fibre with an extra layer of Kevlar in the cabin area. It can be fitted with one of three Rotax engines, the 912, 912S or the 912iS. You also have the option of a ground or in-flight adjustable prop. There are options for carby heating, flap controlled oil temperature control and a few other goodies.

Where it gets really interesting for me is what Aeropilot has engineered into the Legend itself.

Things like a sprung, steerable nose wheel with an adjustable damper. There is an inspection flap in the top cowl which allows the oil to be checked without removing the entire cowl. It has a tinted 3mm formed windscreen, cabin heating and two zone ventilation. The throttle is on the centre console, reachable by either occupant and there is a central armrest which opens up for storage. Directly behind the throttle lever is the brake handle so it's a short trip for your hand to go from the throttle to the brake after landing.

Remote controls on the yokes (depending on the radio you select) mean you never have to take your hand off the flying controls to change radio frequency.

The rudder pedals are hinged from the top rather than the floor which makes for a very clean floor and reduces the likelihood of some stray item fouling the pedals. Another great option is the Teflon coatings on the control columns to eliminate sticky controls.

The doors have padded armrests and pockets with provision for a drink bottle. They're held open by a gas strut cleverly hidden under the instrument panel and attached to the top hinge. The doors latch by simply pulling them closed. They're lockable and opened by pull handles inside and outside.

The adjustable seats have high backs with headrests and, as the seats are moved forward, they also move upward, accommodating height challenged occupants. But there is substantial headroom for taller pilots like me as well. Behind the seats is a large open luggage area which can be fitted with a restraining net. As is the case with the 182, the Legend has back and side windows for great rearward visibility.

The back window has been designed and tested to allow exit for the optional rocket powered parachute that sits at the back of the luggage area. The interior is fully lined with carbon fibre panels.

On another type of aircraft I had looked at, the manufacturer attached the brake lines to the rear edge of the composite landing gear legs using nailed on wire clips!

On the Legend, the brake lines are routed through a moulded-in channel inside the leg. Details like this really impressed me.

The electrically operated flaps are a slotted gouge design, operated by two buttons on the throttle handle. The elevator trim is also electric and operated from a switch on the yokes. The standard fuel tankage for the Aussie model is stainless steel 55L tanks with lockable caps in each wing giving a total of 100L useable. There is also an option for 130L. The fuel tank vents exit from the outboard trailing edges of the wings so vented fuel won't drip or get blown back onto the aircraft.

An optional lighting package offers LED tail and belly strobes, in addition to wingtip strobes incorporated into the nav lights. There is also a multi-LED landing light in the leading edge of the port wing. Small eye bolts pass through the top of the struts for tie down points. The ends of the struts have fairings, finished off with an edging strip.

Aeropilot will put whatever you desire on the instrument panel. They custom make the panel fascias out of your choice of carbon fibre or sheet metal and cut the holes using a water jet cutter which makes accurate, fuzz-free holes.

With some limitations, Aeropilot will also paint your new baby in whatever colour scheme you can dream up. There are a range of options for the interior colours and materials, including leather seat edges and armrests.

The basic empty weight of the Legend averages 330kg depending on how much optional stuff you include. Probably the heaviest is the ballistic parachute which adds around 15kg.

They can also be supplied with floats with three or four wheels! The Australian dealer is Silent Wings Aviation. Ed Smith and Greg Doyle are easy to talk to.

There is so much more to this aircraft than just its stunning good looks. It would take another dozen pictures to show what I saw in Časláv. I loved the clever engineering in it, such as the start button on the choke handle, and the quality of fabrication and finishing. The Legend looks even better in the flesh than in the pictures.

Ours will be arriving late August and we will gladly show it off to you.

Lucie, Aeropilot's international sales rep and Jaromir, the Managing Director

The Thatcher CX4

BY ARTHUR MARCEL

American baby boomer David Thatcher was a fan of the radio aviation serial hero, Hop Harrigan. Hop's famous aircraft was called the CX4. So, in 2004, when, at the end of a long career maintaining other people's aircraft, David retired and had time on his hands to design his first aircraft, it was perfectly natural he should call it the CX4 in honour of his childhood radio hero.

Moreover, the Thatcher CX4 is everything the rest of us baby boomer Hop Harrigan fans expected this mythical fighter plane to be. Not only does it have the looks and the performance we always dreamed it would have, but those four unmuffled VW exhaust stacks give it every bit as much aural presence as the original radio-show plane.

"CX4 is probably doing more to revive interest in single seaters than any other"

In fact, the design has captured the imagination of would-be fighter pilots around the world. According to the company website, there are now 560 CX4s either flying or under construction in 21 countries. There are 55 two-seater CX5s being built as well (only the prototype CX5 is currently flying, having undergone thorough test flying and evaluation prior to the plans being released).

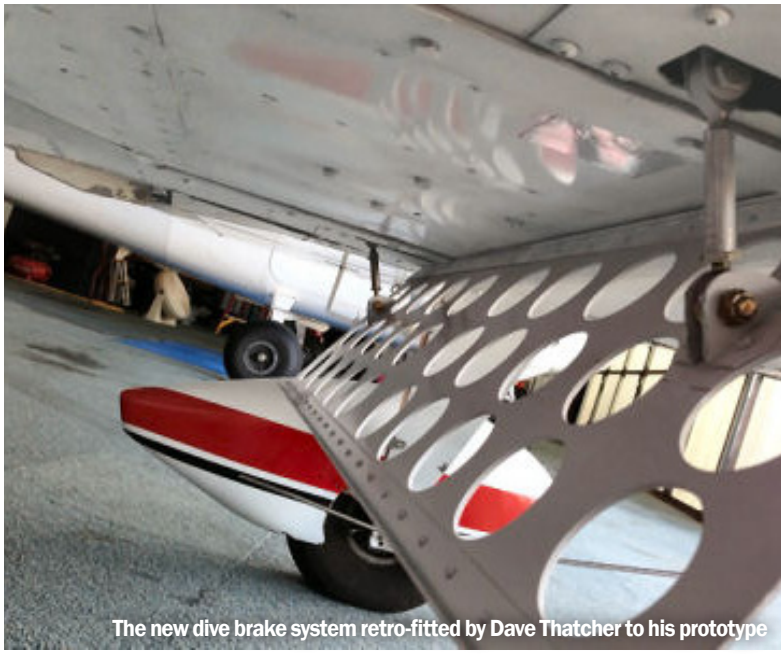
In Australia, there are 45 CX4 and five CX5 plan holders with many projects at various stages of completion. In my local area (South East Queensland) I know of two aircraft flying and another three under construction. The first CX4 I saw finished was built by my friend, Kevin Osborne, and this distinctive canary yellow plane now belongs to Jennifer Beck at Gympie. At the time of writing, I believe there are a total of five completed and flying CX4s in Australia.

Errol Grams from Hodgson Vale near Toowoomba has a white and maroon (what other colour for a Queenslander) CX4 already hangared at Pittsworth and Bazil Dennis from the Gold Coast has almost finished his 2,300cc RevMaster powered hottie.

In November last year, three Australian CX4 builders went to the inaugural International Thatcher Aircraft Fly-in in Pensacola, US. Accompanying Bazil Dennis were two South Australians, former RA-Aus tech man, Dean Tompkins, who has almost finished his project, and Mick Wright, who was the first ever to build and fly a CX4 downunder. Dean lives in Millicent and Mick is based at Gawler. Despite inclement weather, the fly-in was a great success and the trio came back further enthused. Mick also came home with a set of plans for the CX5.

The CX4 is a low wing, single seat monoplane constructed primarily from super strong, corrosion resistant, 6061-T6 aluminium alloy. The aircraft has a single fuselage mounted fuel tank in front of the cockpit, no flaps and full span tapered ailerons, all of which make removing the wings a very simple procedure. The main undercarriage is wide and strong with differential toe braking and castoring tail wheel. The long nose restricts forward vision on the ground, so small weaving turns are required when taxying. Nose wheel versions of both the CX4 and the CX5 are already flying, by the way, an example of which is Errol Gram's aircraft.

The CX4 has a sliding canopy which must either be closed or removed for flight. The cockpit of the prototype was apparently a little cramped, so a wider and deeper modification has now been incorporated into the plans and this is how most aircraft have or are being made. Also, many builders are adding their own small improvements to the design. For example, Errol has strengthened his canopy frame to enable him to use it as a handhold when climbing out, and Bazil has designed and built a very neat under-fuselage slotted dive brake system which will allow steeper approaches. (Dave Thatcher retro-fitted a similar system to the prototype CX4).



The new dive brake system retro-fitted by Dave Thatcher to his prototype

Bazil Dennis from the Gold Coast

The single-seat aircraft market in Australia has been quiet for a long time. The arrival of the CX4 is probably doing more to revive interest in single seaters than any other factor. The CX4 is an attractive but economical aircraft with excellent handling and performance. It is also relatively straightforward to build. At the moment, there are not too many of these nifty little 'fighters' around, but the situation is changing quickly. Expect to see more of them turning up at an RA-Aus fly-in near you in the future.

If they were still around, Hop Harrigan and his sidekick Tank Tinker would definitely approve. This is an easy aircraft to fall in love with. For more information on the Thatcher CX4, visit the Thatcher website at www.thatchercx4.com

PILOT TALK

The Ops team

Flying in the face of our humanity

There have been a number of fatal accidents involving RA-Aus aircraft this year.

These have included a homebuilt aircraft which collided with terrain at Sublime Point near Wollongong and a mid-air collision between a Thruster and a Drifter resulting in a dual fatality near Townsville. Our condolences and thoughts are with the families and friends of the pilots involved.

On the list of fatal accidents from last year were a collision with terrain as a result of a pilot taking photographs at low level, a collision with terrain due to fog or medical incapacitation and a collision with terrain (see the pattern?) while low flying.

Our investigation into one accident revealed evidence the pilot deliberately entered cloud, and that it was a regular occurrence for him, despite the fact his aircraft was not equipped with the appropriate instruments. This comment is made with full acknowledgement that other members of the pilot's aero club had already raised their concerns with him. All our pilots are trained, know the rules and are aware of the circumstances of poor decision making. The saddest part of any pilot's poor decision making is when those left behind have to ask why?

The fact this pilot had previously gotten away with it created a 'normalisation of deviance', which is a phrase which means the pilot did it once, found there was no immediate consequences and thought he could continue to get away with it. But, as we see from time to time, repeating a decision poorly made the first time can end in disaster.

All fatal accidents provide lessons we can learn from, however nothing much has changed since the Wright brothers first flew. Mechanical factors aside, including engine failure or fuel issues, pilots continue to have serious accidents mostly because of poor decision making or human factor errors.

Factors influencing the successful outcome of a flight, as we all know from our Human Factors endorsement training, can include weather, fatigue, family or work issues, alcohol or drugs, aircraft airworthiness and traffic levels. Significantly, our decision making is often heavily influenced by our personality type. Most of the serious and fatal accidents RA-Aus has dealt with in recent times could have been avoided if the pilot had considered these issues, or had a trusted friend or fellow pilot raise the issues with them before the flight.

However, when it comes to fatal accidents, the RA-Aus community can show its strength. Pilots do not often operate without some interaction with other pilots - at airports, aero clubs, Flight Training Facilities, or with other aircraft owners in the same hangar. If you see another pilot about to commit to a flight, and you believe they haven't considered all the factors potentially affecting their flight, or if you have a concern for the safety of the pilot (and others flying with the pilot), please say something! Although Australians culturally prefer not to become involved in other people's lives and decisions, this is one key area where the culture requires a significant change.

> *"Fatal accidents provide lessons we can all learn from"*

Ramifications of a fatal accident include more than just the immediate family and friends of the pilot and his passenger.

Coroners, police, CASA, the ATSB and other organisations assess RA-Aus - its freedoms, privileges and responsibilities - on the number and type of fatal accidents involving our aircraft. They then put pressure on all of us via coronial findings, police investigation, CASA regulation or ATSB recommendations based on these accidents.

Operations does not enjoy sitting across the table from the Director of Aviation Safety or in a courtroom with a Coroner and having to explain why our pilots are involved in preventable fatal accidents. Nor do they help us expand our current privileges.

Another fatal accident from last year involved a pilot focussing so much on taking a good photo of his neighbours' house for a real estate advertisement that he failed to maintain situational awareness and hit a tree. This accident could have been easily avoided by implementing one of two possible courses of action. Either, not operate below 500ft AGL or take along a passenger to operate the camera, which would have allowed the pilot to concentrate on manoeuvring the aircraft safely for that perfect shot.

Another fatal accident last year (involving a VH registered aircraft) happened when the pilot operated below 500ft along a river. The aircraft struck a power line and killed a young passenger. That pilot has been charged with manslaughter and is facing a possible jail sentence.

The message with all these reports is tinged with sadness for the loss of life and the tragic waste which could have been avoided if the pilot had operated in the safe regime of flight for RA-Aus aircraft. That is, above 500ft AGL and clear of cloud.

But having said this, we should also compliment many other pilots for successfully and safely carrying out emergency landings across the country last year. These accolades should be shared by our community of instructors.

RA-Aus has to be careful when releasing information about fatal accidents. We don't have protection from civil suits, unlike the ATSB, which releases accident reports under the Transport Safety Investigation Act 2003. Due to budgetary constraints, the ATSB is rarely involved directly in investigating our accidents, however considerable technical expertise has been made available to RA-Aus on request. This includes analysis of GPS or EFIS equipment (in some cases, very badly damaged), assessment of metal or fibreglass components or cables for any pre-existing structural failures and formal and informal reports to be included with Coronial submissions.

For any serious accident, RA-Aus response depends on the involvement requested by the police at the scene. Thankfully, in both the cases above, as with the most of our fatal accidents, local police were pleased to have RA-Aus consultants assist and provide specialist knowledge regarding our category, aircraft registration, pilot training information and industry specific knowledge.

RA-Aus has also recently moved towards formalising our relationship with state police and the Coroner's office with a draft Memorandum of Understanding (MoU).

These processes make dealing with the tragedy of a fatal accident a little easier, but do nothing to address the core issue - pilots must remain vigilant, constantly assessing their flights to maintain safety and ensure good decisions are the order of the day.

NOTE: *This article is based on preliminary or non-final information regarding the accidents mentioned and is intended to bring readers attention to the issues raised in the reports. It is not intended to judge or reach any definitive conclusions about the ability or capacity of any person, living or dead or any aircraft or accessory.*

Pre-flight inspections
an unnecessary chore?

BY PETER HARLOW

It was a clear, cold and frosty morning in late 1969, the grass crunching under my feet as I walked to the hangar with my flying instructor, Mr Beadle.

We opened the hangar doors and under his watchful eye, I began my daily pre-flight inspection of the little Piper Colt, Juliet Delta, in which I'd flown my first solo less than 10 flying hours before. My fingers were cold, my breath forming clouds of vapour in the still air inside the hangar but I was warm inside. Along with three other lucky school cadets, I was learning to fly – an ambition I'd had for all of the 17 years of my existence. Even better, the Royal Naval Fleet Air Arm was paying!

Nearly 45 years and several thousand hours of piloting later, I can still remember that and many other such mornings as I grew from raw novice to a basically competent flyer. But if it wasn't for Mr Beadle, I might not have made it this far. Because, apart from teaching me how to fly and guiding me through the written exams to my licence, he instilled in me an almost obsessive attention to the detail of that first inspection of the day.

Nowadays, I fly recreational aircraft – a concept unknown back then. Engine and airframe reliability have advanced beyond belief since my first solo in that old (even then) Colt. After all, today's planes are so reliable and well-made, the daily inspection can dangerously become an almost cursory 'walk round'. My blood runs cold when I see, unfortunately all too often, a pilot/owner open the hangar doors, pull out the plane, get in, put on the headset, start up and taxi out to the end of the runway and take off. No inspection, no warm up. No engine run-up. Could this be one of the reasons why insurance is so expensive?

Every year, at major fly-ins in the US and Europe, the RA-Aus and SAAA equivalents have competitions for people to inspect aircraft and spot the (deliberate) pre-flight problems. At best, the eagle-eyed winner usually finds around 75% of the items; most of the rest of us manage around 50%. I thought I was pretty good at my daily inspections, so I had a go at one of these competitions. And failed miserably – I picked up about a dozen items but what did I miss? A (slightly) loose spark plug; a loose spinner screw; a spanner left under the seat where it could jam the rudder cables; a compass which swung with control stick movement; a loose seat belt bolt; and unbelievably, a control stick which moved the ailerons the wrong way (doesn't bear thinking about, does it?). All these examples have occurred in real life and caused accidents.

So what do I do now when I inspect the plane before the first flight of the day?

First of all, I follow the written checklist for that aircraft – however well I think I know it or however often I've done the daily. Bad habits can creep in very quickly if you do it from memory – you begin to skip items and soon forget them completely because they just don't go wrong. Until they do. And how many times has someone arrived in the middle of your inspection to distract you? Mark your place on the list – difficult to remember it after 10 minutes of chatting – or go back to the beginning and start again.

I don't just look – I pry. As Mr Beadle said – I have two eyes, two ears, two hands and all should be used during the pre-flight. I remember his face when I took hold of a plug lead, which looked fine, only to find it waving in my hand, the cap was just resting on the plug...one of his little tests to show me that just looking was no good. Checking plugs are screwed in properly is difficult if you don't touch. The ubiquitous Rotax 912 holds oil in the sump, which should be pumped back to the reservoir before checking the level. This usually takes a few rotations of the prop before that quaint gurgling sound tells you the oil's all pumped through. Do you always pump the oil before checking or have you memorised the level without pumping and reckon that's OK?

Haste is a potential killer. There's never water in the fuel – leave it, I'm in a hurry.

The tyres don't look flat – must be OK. Checking the coolant level (and a few other important things) often means the chore of taking off the top cowling – no worries, I'll leave it and it'll show in the run-up if there's a problem. All the safety pins were there last week – why would they fall out? And cracks in brackets? – there aren't any service bulletins, so there probably aren't any. Low risk, I'll chance it. Coolant and oil hoses – always rock solid. Radio antennas just don't fall off. Do they? Control cables/rods – why should they fail now, after 10 years of reliability?

I keep an old piece of mat to kneel on.

Mostly, we go flying in (reasonably) clean clothes.

One day I caught myself bending awkwardly on a low wing plane, trying not to muddy my jeans, to see the wheels, tyres and brakes. And realised I wasn't really checking them at all. So now I get down and stay clean, with the help of my mat.

A torch is also essential, even in bright sunlight – in fact even more necessary as your eyes take time to adjust to the gloom in the darker parts of the airframe. A couple of screwdrivers – flat and cross head – are useful. But beware of tightening screws every time you inspect. I remember one owner tightening an oil hose clamp so much it eventually cut the rubber hose.

When you test the fuel, what are you looking for? Just bits of muck in the fuel? Water maybe? How do you know the tester cup of liquid you have just drained is actually fuel? One of the Navy's pre-flight lessons to me showed you can drain a tester cup full of water – it looks like fuel (faint blue colour), smells like fuel (well, it would, wouldn't it) but it is actually water which leaked in through the filler cap. So I always check twice and rub a little of the tester cup contents between my fingers – water feels different from fuel. And how many people put the fuel back in the tank after testing? I suppose the engine warm-up and run-up should pick up any water, but if you switch tanks or open both before take-off, the engine might run rough or stop at a very inconvenient moment.

"Two eyes, two ears, two hands and all should be used during the pre-flight."

I'll leave you with a last thought – how many of us do a post-flight inspection? Very few, I'll bet. Mainly because you want to put away the aircraft and get off home. But post flight can be the best time to spot problems – coolant and oil leaks can dry up before the next flight; what's tight on a cool engine may be loose on a hot one and vice versa. Finding a big stone chip on the prop before you leave could save a delayed or cancelled flight if you don't notice it until the next pre-flight. Ditto a cut in a tyre. Or a small leak in a fuel drain.

Aeroplanes cannot be like motor cars, which you can safely pull to the side of the road if something stops working properly. In an aeroplane, your life can depend on everything continuing to work in harmony.

Treat every pre- and post-flight inspection on that basis and you're well on the way to becoming an old pilot.

FLIGHT INSTRUCTOR'S FORUM

Facilitated by the aviation guru Professor Avius

Wrong Turn!

The second part of the "Big Three' killers in light aviation – Stalls on base and final.
The first part - Engine failure after take-off – appeared in *Sport Pilot* April 2015.

If we had to list the most dangerous phases of flight in a standard operation or training exercise, the last two turns in the circuit would have to be very high on that list. Statistically it is overly represented in accidents and unfortunately, mistakes during these critical phases are generally fatal.

So what is going on? As usual, there's no one single factor but if we had to point the finger at something it would be the uncoordinated stall. If an aeroplane is allowed to stall in an uncoordinated state, the result can be a rapid entry into autorotation, i.e. a spin. Being able to recover a spin from 1,000ft or below is not something I would bet the farm on.

So lets look at the problems.

We generally perform downwind checks, get the aeroplane set up for the base turn by slowing, reducing power, maintaining height by adjusting the attitude and then... Wait, stop there. Here we have the first link in the deadly chain. When we slow the aircraft down and maintain height, we are effectively increasing the angle of attack. So now the aeroplane is flying with a moderately high angle of attack.

As we get closer to the turn we look right, centre, left etc. Here we have the second link in the chain. A low time pilot, at this stage of flight is starting to reach the limits of how much he can do cognitively, so he is starting to think about every input, every control reaction. So looking around he is slightly distracted. In this state, off comes the power, and on comes the base turn.

Lets pause the scenario here, we have:

- Pilot slightly distracted;
- Angle of attack moderately high;
- Power reducing;
- Airspeed bleeding;
- Stick coming back to stop the nose dropping;
- Bank coming on, and possibly uncoordinated control inputs.

Hit play, now, because the pilot has not co-ordinated the turn, the nose is starting to yaw , roll and pitch into the turn. 'No problem', says the pilot. "I will simply stop the nose dropping with more back pressure and stop the bank with opposite aileron'.

Hit pause again. Now, we have the stick right back, the angle of attack increasing rapidly, the down going aileron (inside the turn) producing more drag than the outside aileron and the wing wanting to drop further into the turn.

As we hit play again, the pilot is now only moments from entering an unrecoverable situation. The last link in this deadly chain is the extra angle of attack.

The uncoordinated flight has lead to an incredible increase in drag which decelerates the aeroplane even further, increasing the nose down tendency. The pilot pulls the stick through the stall position to compensate and the rest, as they say, is history.

The same scenario can be applied to the turn onto final, with two more deadly factors.

Imagine the same scenario playing out, but add a tailwind on base.

Now we have a pilot, sensing an increase in speed and compensating by raising the nose, then being pushed through the turn and overshooting the centreline.

'No worries', he says. 'I will just steepen the turn, boot in some rudder to get me back on track'. And he never knows what hit him. At 500ft, this mistake will smite him before he has time to register the stall warning horn.

How can instructors train a pilot to avoid this deadly situation?

There are several things we can do, but the three most obvious things are
Teach the importance of co-ordinated flight.

- Rudder and aileron must be used together to achieve accurate co-ordination at all times. Exercises like rolling on the ball, figure 8's, etc practised and perfected early in the pilot's training will make these inputs cognitive and reduce the risk significantly.
- Teach stalling in turns. The thing about stalls in the turn is the attitude does not look bad. The conventional stalling practice we do has the nose relatively high. We are probably even teaching that the symptom of a stall is having the nose high. Yes, if you have the nose high, you could be approaching a stall, but the nose does not have to be high to stall an aeroplane. And in the Professor's opinion, it is this one crucial misunderstanding which causes these types of accidents.
- Teach a cognitive reaction to un-stall the wing by moving the stick forward. Bank and yaw are secondary considerations at this stage, stick forward then fix the bank.

Practical flying techniques in the circuit that can reduce the likelihood of these accidents are:

- In slippery types, configure for the base turn early - Take flap and get speed settled before commencing the turn.
- In draggy types, leave power on through the base turn to keep some energy, stop the nose dropping tendency and remove complexity from the turn procedure.
- Plan ahead for base leg tail winds, identify the situation and prepare the final turn early.
- Limit bank angles to 30 degrees and emphasise co-ordination.
- Increase stick position awareness in all turning exercises with patter such as "monitor bank-balance-back pressure".
- Limit pilot distractions during critical phases.

Next month:

VFR into IMC accidents

Seeing USA from above

BY JOHN GILPIN

I've long wanted to fly the high desert areas in the western US. The scenery is spectacular.

High mountains, deep canyons, volcanoes, lava flows, dramatic rock formations, everywhere. And because this is dry desert country, there are no trees to hide the view. You'll see lots of rocks. I'm also interested in water supply, power generation, agriculture, commerce and transport, all of which the Americans do in a big way.

While still in Australia, I searched maps and the internet for points of interest and plotted them on a Google Map. Then I scanned the aviation Sectional Charts for quiet airfields in the areas I wanted to fly and plotted them on the map. By zooming in I could see what the airfield actually looked like, amazing!

When in the US if I wanted to fly a particular feature, I just selected the nearest likely airfield and set up there. I mostly tried to use unattended fields and there are lots of unattended, run-down airfields these days. Some were open access, just drive in. Some were surrounded by chain-link fences with locked gates. I had to call the manager to get the pin code or sometimes find the local sheriff to gain entry. These quiet airfields were also excellent places to camp. Usually with toilets, sometimes a pilot's lounge, and pretty safe, because vandals mostly stay away from airfields. I usually had the place all to myself. It was all fairly convenient and worked really well.

This sort of ultralight flying is nothing like the typical Sunday morning flight around the home patch, flying just for the thrill of it. I used the aircraft as an observation platform, for viewing and photographing what I saw on the ground. I like to call my aircraft my 'high-clearance off-road vehicle'. I usually identified features I wanted to investigate, whether geographical or man-made, from maps or internet, then used the aircraft to get a unique perspective on them. Travelling by road only gives you a flat roadside view. From 1,000ft above, that same view becomes spectacular!

The Kolb is particularly suited for such observation, because sitting right in front gave me an unparalleled 270 degree vista. It flies slowly and is very stable even when hands-off the controls, which gave me time to concentrate on composing the image in the viewfinder.

Every pilot at all times should watch out for where he/she would land if the engine should quit, but very few really do that because modern aircraft engines, especially when maintained by a professional mechanic, are so reliable and sitting in a solid, comfortable cockpit gives you a feeling of security. I don't get the same feeling when sitting out in front of a buzzing 2-stroke, maintained by myself. If the noise does stop, the aircraft glides really well and lands fairly short, but my feet are the first to

arrive and the rest of me is not far behind and there's not as much structure for pilot protection as I would like. I've reinforced that protection as much as I can without a full workshop, but I still feel exposed.

The engine is a Rotax 503, dual ignition, the best 2-stroke engine ever developed for aircraft use, but still a 2-stroke, with the inherent liability of such a lubrication system. In the past I've flown 1,000hrs in front of a similar engine, with never a failure, but I still can't really relax over hazardous terrain.

And there's the big difference from flying around the home patch where you know the terrain and already have landing sites in mind in case of an emergency. In this case, it was all new territory to me and often harsher terrain than I would like to fly over, but still the only way to get to the places I wanted to see. So I was forever peering down, trying to assess the landing options down there. I always welcomed some sort of road or 4WD track and followed them whenever possible, but I knew from experience that it was always a lot rougher than it looked from above.

I always kept enough altitude to give time to set up a glide to the best option. 1,000-1,500ft above the terrain gives the best panoramic perspective for photography, so I was usually at that height, or higher if necessary. I never fly really low just for the thrill of it; that's a different flying experience which doesn't suit my purpose at all; it's high risk and not good for photo ops.

A lot of the photographs I took look like there's no decent terrain down there at all, but usually I was on the edge of the worst and there were better options behind the camera. I sometimes had to turn back when I thought the risk was too great and that was a real disappointment when it happened.

To see what I wanted to see, I sometimes had to be bolder than I would have liked, but I do want to continue to be an older pilot so had to be willing to compromise.

"Nothing like the typical Sunday morning flight"

In case I did have to land rough and was stranded, I carried a Spot satellite locator on my person and a Personal Locator Beacon in the aircraft. I also had a cell phone if there was a signal and an air band radio to contact passing aircraft.

I carried two hydro packs of water and some granola bars for sustenance. I also carried a sleeping bag, a space blanket and insect repellent in case I was stranded overnight as well as lighters and matches for a fire. Also I had a powerful flashlight and a signalling mirror.

To navigate and avoid controlled or restricted airspace, I used a moving map GPS and the local Sectional chart. The aircraft had a Second Chantz ballistic parachute newly repacked and new rocket motor installed, so I did have that as an ultimate backup. I think I prepared as much as possible for these flights.

Seeing USA from above Cont.

What with constantly peering down to assess landing options, finding the features I want to see, manoeuvering for the best photo composition, watching out for other aircraft, watching out for restricted airspace, calculating fuel reserves and assessing headwinds to get back to base, let alone flying the aircraft, it was a busy time up there. In fact quite intense and seldom relaxing.

The engine and propeller were extremely noisy, to the point of stress even with an automatic noise limiting headset. Add to that, freezing early morning air at altitude (and possibly bladder stress) and I sometimes wondered why I did it.

But of course, you don't get something for nothing, and in this case the reward was well worth the effort.

I don't claim to be a photographer - I just try to take good snapshots. I'm not interested in artistic photography, just trying to capture the panorama I see. I know a bit about the importance of light and composition and, of course, it's easy when the vistas are so grand from up there.

I used a basic Cannon DSLR, set on auto because there was no time to adjust settings in such a moving and rapidly changing situation. I always used a polaroid filter, maybe too much. I'm pretty satisfied with the results and keep the album running on my screen saver and re-live the adventure every day.

The Kolb is by far the best folding aircraft available. The tail folds up easily and the wings fold down and back along the boom tube, so it's a narrow tidy package.

Takes me about 20 minutes at leisurely pace to unload and unfold, ready to fly, and the same to fold/load again. Easily done on my own.

It's a wonderful asset to be able to easily trail the aircraft to different locations and then set up and fly. So many ultralight flyers are confined to their home field and close surrounds, but I'd get really bored to be confined like that. To me it's not enough just to go up and fly around, I need to go somewhere and see something new.

I've travelled around a lot in bigger aircraft, camping under the wing and it's a great adventure to be flying out over the horizon for a long trip. But it gets really old if you are stranded by bad weather, with the aircraft tied down outside in the weather and no transport to town.

With this rig it was really good to travel around with a comfortable bed on wheels and the aircraft packed safely away in its own portable hangar. If bad weather was forecast for a week, I just looked at the weather map and drove somewhere better.

The trailer I had was excellent. It was narrow enough to be able to see behind when towing and light enough to be really easy towing, only cost an extra 3mpg. I hardly knew it was there, even towing with a 20 year-old van.

LEARNING TO FLY

ANTHONY SIBARY

Silence is NOT golden

Those who know me say I am rarely silent. Some have mentioned that I can talk underwater. Well, that may be the case but what I do know is that I am learning the importance of talking when I'm in the air.

And not only talking, but listening to what is being said by others. I was reminded of the importance of effective radio communication during a recent flight. The weather was perfect and I headed out to YOAS, keen to continue building hours in the left seat.

It was a weekday morning which meant there were only a couple of aircraft flying, but as I was to discover, thanks to a very proficient helicopter pilot this flight was another great learning experience.

I was flying in the area to the south of the airstrip and decided to end my hour by spending a little time in the circuit. As I was preparing to enter the pattern, I heard a helicopter pilot state she was joining crosswind. I could not see her, but thanks to her clear and concise radio transmission, I now knew where to look for traffic.

I let her know when I had her sighted and informed her I was going to remain on the southern side of the airstrip until she completed her work in the circuit. My transmission was acknowledged and I continued to monitor her position.

As I watched the helicopter depart the circuit, the pilot again transmitted her intentions and thanked me for my patience. I was able to complete several touch and goes in near perfect flying weather, which was great.

I have no idea who that pilot was and will most likely never know. What is important to me though, is that the proficient radio communication she displayed kept us both safe. That helicopter pilot sent clear and concise radio messages I was able to understand and act upon. I hope she found my messages were just as effective.

"Every time I fly I do it in a professional way"

I am not a professional pilot (yet) but every time I fly I make sure I do it in a professional way.

I take my time completing my pre-flight checks and, if I am distracted or disturbed by something or someone, I start over. I use checklists in the cockpit. I know of other RA-Aus pilots who don't use them and that is OK because it obviously works well for them.

Like communicating via radio, my checklists are clear and concise. It has taken me a while to get to this point, trying different fonts and layouts and I now have several usable checklists which neatly fit onto my kneeboard.

They look professional and I am proud of them. Most importantly of all, they help keep me safe. There may come a time when I find I no longer need them but, to be honest, I cannot imagine flying without them.

Using the radio in a proficient manner is a must as far as I am concerned. Before I press the button to transmit I have already worked out what I am going to say. I know the call sign of the aircraft I'm flying, where I am in relation to the airfield and what my intentions are. I speak clearly and confidently, not sharing war stories because that's what the pilot's lounge is for.

We choose to fly RA-Aus for fun and recreation. Just like a great recipe, you need to have all the ingredients to make what you are cooking (in our case the experience of flying) great. You need to be prepared and follow all the necessary steps on the ground and in the air to produce something of which you can be proud. A professional job, so to speak and one you will be willing to do again.

With each hour I fly I am a little closer to gaining my passenger endorsement and sharing the many joys of flying with my son. But I will save that adventure for my next column.

See you in the pilot's lounge for cocktails and debriefing.

HOMEBUILDER

DAVE EDMUNDS

Charge!

Last month I wrote about using tablets, IPads and the like, for navigation.

The power consumption of these devices is pretty meagre, considering what it is that they do, but ideally you will run some back-up from your aircraft to ensure you can use the devices for a full day's touring.

I was attracted by those two amp USB chargers with two outlets which plug into the cigarette lighter (power) socket in my Jabiru. They sounded like just the job for my navigation devices. And they work just fine – as long as you do not want to use the radio. I tried all sorts of things to stop the white noise on the radio, including building a completely shielded aluminium shell, but nothing worked. The noise made the radio unusable.

All of these devices use switchmode control. This is a process whereby the chip in the USB device outputs a square wave at supersonic frequency with a variable on and off time (mark-space ratio) and the role of the rest of the circuitry is to average out the on-and-off voltage to produce the final regulated output voltage. These devices put out five volts, regardless of the load or any input voltage above about 6V. A 5V output is part of the USB specification. They sense the output voltage and adjust the mark-space ratio accordingly to ensure the voltage is locked very close to 5V. The oscillating frequency of the particular device I use is 380KHz, which produced a lot of white noise on the radio.

It is possible to build a device which produces a regulated 5V output, but does not oscillate. This requires the use of a linear regulator. The problem is that the efficiency of such a circuit using a 12V aircraft system is around 35%. So, if you are running two one-amp devices on your USB system (10 watts), you will need to dump 18W as heat somewhere. To do this, your circuit will require a substantial heat sink and a fair amount of free airspace around it. If you are using a 24V system, your efficiency drops to around 17% and you will need to dump 46W of power.

Vority USB

For comparison, the modern switchmode circuit designs are around 90% efficient and the heat loss is therefore very low and requires no special design to get rid of it. The efficiency of these circuits does not vary much with input voltage.

As modern electronics has miniaturised, the switchmode regulator chip has also had to shrink in size, and so it has had to become more efficient to reduce heat generation within the smaller chip. To drive up efficiency, the chip designers increased the switching speed of the components within the chip, that is, the transition time from 'on' to 'off' on each cycle, referred to as the 'slew rate' in electronics. The effect is to generate an even more intense range of radio frequency harmonics than the older designs.

I spoke to Microair, the people in Bundaberg who manufactured my radio, and their opinion was that the interference from the USB device was being picked up by the microphone chord. This effect may vary from one model to another because of changes in the microphone amplifier circuit within the radio, so perhaps not all Microair radios have the problem and it may variously effect other brands and models. It is also, in part, dependent on the installation of the radio.

There is a considerable amount of chatter on the internet on this topic as it relates to cars, much of which on this rare occasion I believe is wrong. The general internet opinion seems to be that the noise is related to engine or alternator interference, but it is hard to see how this explanation works.

I looked up the specifications online for the chip used in this first noisy device and found a reference circuit. This is pretty much universal in chip data sheets. However, the device I pulled apart did not follow the reference design, which I thought could explain the electrical noise.

So, using the free Eagle PCB software I redesigned the printed circuit according to the chip specifications and sent the file off to China for manufacture. I was pleased with my design, but when I built up the circuit, it was at least as noisy as the very sloppy original device, despite my quality improvements. What a pity.

On hunting around the internet I found a device advertised as low interference, so I purchased one, and it works perfectly, with no hint of interference.

USB Doctor

The brand is Vority, and it has a 1 amp and a 2.1 amp socket so happily powers both an IPad and an IPhone. It is available through Amazon. The fact that it worked perfectly in my Jabiru is absolutely no guarantee it will work in your aircraft, but it is odds on it will work better than some other brands.

The Vority device is operates at 90% efficiency, and therefore, when supplying 3A through its two ports, is dumping only 1.5W as heat.

USB charging is something of a minefield. Bear in mind that a partially charged battery looks like a short circuit to a charging device, so any piece of battery-powered electronics connected to a charger will have circuitry to limit the current it draws. As the power of tablets and phones increases, so do the power consumption and the capacity of the batteries, running ahead of the formal specification for chargers.

As Apple is in charge of its own universe, and perhaps the entire universe, it conforms to a specification whereby the voltage on the USB data pins of a charger indicates the current it can supply. So, it is quite safe to charge a large IPad on the smallest Apple IPhone charger. Many non-Apple chargers conform to the Apple specification, but of course some do not.

Android charging is more complex. While Apple follows one version of the USB specification, Android devices follow a range of different protocols. The Vority device I mentioned above has stamped on its package that is for use with Apple devices. It probably works well with Android devices, but may well drop back to some low default charge level with some. I have not tested it on an Android device.

One check is to purchase a USB charge doctor, as shown in the photo. They sell for around $8, including the postage. It has an LED display that will tell you the current supplied and the voltage. I would not rely on any USB charging device for an extended trip unless I had tested it to make sure that it delivered its advertised current to my particular device.

If you want even more redundancy, buy two USB chargers and slip the spare into your flight bag. There is little point in using a charger which only provides some unknown range extension before your navigation device turns off or charger fails, somewhere around Rabbit Flat.

Members' market

3408 JABIRU UL 2.2

TT 820hrs A & E. Original motor untouched. Long wings with winglets & vortex generators. Excellent STOL performance. Cruise 95-100 knots @ 14 lph. Electric T & B, strobe, Garmin aera 500 GPS. Spare prop. Always hangared. S.A. phone John 0400 865 868. $30,000 ono.

3490 JABIRU 170C

August 2008 factory built. 438 hours TTIS Option 1 panel plus Microair transponder, FC-10 fuel computer, garmin 196 GPS. 10ply front and mains. Always hangared. All AD's complied with. $55000 Contact 0417 131 816

3526 X-AIR

X-air Standard .Reg 19-3322. Rotax 618. Brolga prop, doors, luggage compartment. X-com radio with intercom & two headsets. Spats not fitted but included. 260 hours TT airframe & engine. Maintainance log. Always hangered & covered. Lethbridge, Vic. Peter 0402 599 306 or Rod 0448 470 390. Reduced for quick sale $16500

3650 JABIRU J200B

19-4103, Avalon winner 2007. Aircraft in excellent condition, always hangared. TT440 hrs serviced every 25 hrs - Mircoair radio. Garmin 296 and 95 GPS. Low fuel warning light 2strobes, manual flaps NIL accidents Will be sold with top overhaul by Jabiru $63,000 ono. Phone: Bevan 0428 536 338 or Email: bevanlane@bigpond.com

3721 SONERAI 2L

Sonerai 2L, Red with white trim, 100 hours, taildragger, Rego 19-4485, Aeropower 2100, twin bings, 4 to 1 exhaust,120 kts @ 12ltrs hr. 9/10 condition. Asking $35,000. Open to all offers. Sadly, must sell. I'm too old for this speedy beast! Contact Rolly 0400 594 886 Yarragon Vic.

3847 JABIRU SP 500

TT 435hrs, 2200 engine solid lifters, new pistons, rings, through bolts, 85 l tank, Icom 200 radio, GME UHF radio, Lowrance GPS, turn and slip, fuel flow gauge, 2 Lightspeed 20xl ANR headsets, large rudder, upgraded undercarriage, always hangared, 100 kts cruise, GME PLB inc. Reduced $35,000. Narrogin WA. 0400 014 924

3875 J230

Jabiru J230. t/t 540 hrs top end a/h 40 hrs ago 2006 and flies like new.3blade,fuel flow meter, UHF, vert compass Alot of extras, Orginally $75,000 would like a quick sale now $55,000 phone 0428 826 551 or arrandale2@bigpond.com

3942 VP1A VOLKSPLANE

VP1A Volksplane. Total hours only 1143, 21 hours since engine rebuild. Registration number 19-0484, Full flying tail, enclosed cockpit. Only using around10 litres per hour, ICOM radio and GPS fitted in cockpit. Thompson Propeller. Well maintained overall and ready to fly. Only $7500 o.n.o. Call Harry 0412 426 581 for details

3991 JABIRU LSA 55/3J

Factory built great aircraft to fly always housed in hangar, engine well maintained with all required updates done 135 hrs on engine and 604 on airframe. Lambswool sear covers, full dash with extra instruments. $33500.00 phone John 0428 727 152 or Email: jolaney@bigpond.net.au

3999 VARI EZE.

Vari. Eze reg198286 engine 0200. 800 hours to run. Radio analog instruments. Cruise 150 KNTS AIRframe 9/10 interior 7/10. Situated Wedderburn NSW. Phone Steve 0425 221 271 $26,000

4000 SAPPHIRE

Sapphire 19 3866. 168hrs 503 Rotax, 3 stage flaps, 58lt wing tanks, cruise 80kt+. Always hangared, ICOM radio. Hangared at Lakes Entrance VIC. $15,000 ono. Ph Jack 0429 801 548 or 03 5156 4355

4233 AMPHIBIOUS TRIKE

Fly off water or land with this fun machine. Ramphos Trident. Rotax 912 80hp. Strutted H15 wing. TT 115hrs. All the gear you need including 2 life jackets, 2 Icaro helmets, 2 headsets. LSA Registered 27th June 2015. Phone Paul 0439 922 323.

4339 HORNET RADIAL TAILDRAGGER

REDUCED Hornet Radial Taildragger 32 hrs total. Suit new plane buyer. 110hp 7 cylinder radial. 3 blade Powerfin propeller. Microair V.H.F. Short field classic style taildragger. Country based, always hangared. Save $$$$ on new price! Must Sell. Demonstration flights available at Tumut. 66k ONO. Please phone 0408 278 012 or Email: airscape@tpg.com.au

4345 A22LS FOXBAT

2011 Rotax 912 ULS, 112litre extended fuel 1350hrs Total time. 85kt cruise @ 17lts p/h (4800rpm) Foxbat hand-control Throttle/rudder option fitted allows people with disability to fly without using their feet. Throttle normally locks in the central position. Making way for new model. $82,500 inc GST mobile: 0427 102 540 Email: sheldon@meritaviation.com.au

4351 JABIRU J230D

Factory built 2008. 321 hours. Analogue instruments,

Microair Radio and Transponder. Garmin396 GPS. Sensenich prop, red leather seats, L2 LAME maintained every 25 hours. Fully upgraded. Life jackets & 10 ply tyres. South Aust based. Always hangared and in excellent condition. $80,000. Phone James 0417 838 991

4354 SAVANNAH VG MODEL

Savannah VG Model - 2008 100hp Rotax 640 hours, Always hangared, Garmin 296 GPS, Tundra tyres (8.00.6) Fuel computer, 150 litre long range tanks, Strobes, X-com radio, Warp drive prop, Odyssey battery Electric trim Well maintained. Located SW of WA. Can deliver. $46000 Ono. Phone Ted 0488644064

4364 TERRIER 200 CAMPER

Terrier 200 Camper 243 TTIS. Garmin 296. Northstar Fuel Flow. Electronic ign with back up. Aluminium tanks. Not being flown enough. Always hangared. Quick sale. $45000. Pieter 0407 446 100 WA

4378 BAYLINER CRUISER FOR SWAP

Available to swap for RAA Aircratft. 2004 Bayliner 245 Ciera. 24.5' cruiser, sleeps 4, shower, kitchenette, 5.0L 250hp Mercruiser VGC on Galvanised Trailer. Market value 55-65k. All offers considered & willing to pay extra cash for more expensive aircraft. Located Agnes Water Qld. Delivery can be arranged. Contact Phone: 0411 961 877 or Email: scaffsales@bigpond.com

4380 KR2 'MINI MUSTANG'

Two place (77kg persons) RA AUS reg 19-3873. 120 kts cruise with 170kts VNE, new (55hrs TT) Jabiru 2200 (ser. 22A3586), 60 inch Bolle prop (TT55hrs), Level 2 serviced, always hangered, 40ltr main header tank with 35ltr wing tanks. Great aircraft, nothing left to do. Reluctant sale $35,000 Townsville Alan Phone: 0407 356 948.

4389 AEROCHUTE AND TRAILER

Narrow head plate Aerochute and trailer 503 Rotex motor 350sq ft chute 238.8hrs Aerochute has all instrements +front hand brake ,hand throttle ,more to list as well as a brand new 500sq ft chute Price $7000 for just machine and trailer or $10,000 with new chute Ph Ian on 0407 767 162

4390 CHEETAH MODIFIED AIRCRAFT

For Sale Cheetah Modified Aircraft 95% completed. 100HP BMW Engine, Fuel Injector, 3 blade warp drive propeller. GROVE undercarriage, wheels & brakes. VFR Instrumentation. All metal wings. Empty Weight 326kg Max T.O wt 54.5kg. $30 000 ONO Please contact Geoff after hours (02) 6724 1436

4397 TECNAM ECHO SUPER P92

Great condition, Long range tanks. Has just completed extensive refit, new glass, leather upholstery, complete strip and respray on Tecnam white, just add the decals of your own design to personalise . faultless condition. will exceed your expectations Price to sell as have new aircraft. $85,000 Phone: 0419 348 288 or Email: pbugg@onthenet.com.au

4398 JABIRU 230D 25TH ANNIVERSARY ED

Factory built 2013. AS NEW CONDITION, SUIT NEW BUYER. Only 84.6 TTIS Dynon Flight Dek D180 EFIS with full 6 EGT+CHT guages. Garmin touch screen Aera 500 GPS. Garmin GA spec COM/Transponder. Nil accidents, always hangared YLIL. $95000 Contact: Stephen 0400 644 208 Email: srise200@gmail.com

4409 FK9-ELA

FK9-ELA $75,000, 80 hp rotax ttis350 hrs lame maintained. Just done a fresh 100 hourly. epirb,garmin 695gps,transducer,elect flaps, computer management screen, adj seats, headsets, twin joystick controls, sep baggage comp, low landing speeds, immaculately maintained, cruise at 90-100 kts@ 11-13ltsph, excellent comfort and visibility, Gawler SA. Phone Mick 0418 831 790

4411 EUROPA XS TAILWHEEL PROJECT

GREAT VALUE. $92,500-firm. Best-equiped Europa project-near finished anywhere. Includes Garmin GTN650 navigator, STEC30-autopilot, Sandel SN3308-EHSI, CGR-30P Engine & Fuel Management system, SL30-nav/com, KR87-ADF, MD93-clock and USB Charger. Electric AH. All equipment TSO's for IFR category. Just panel-worth-more-than-USD$40K. Zero-time-Jabiru-3300 engine-solid lifters. Amazing value aircraft. Call Tony 0413810093

4414 FOXBAT A22LS FOR SALE

Rotax 912 ULS, 112litre fuel tank 85kt cruise @ 17lts per hour (4800rpm) Dynon FlightDECK 180 WITH Garmin Aero GPS. Total Time in service 1000 with approximately 700 hours on the engine. Mode S transponder. Please contact by email neel@soaraviation.com.au or mobile 0488 747 069

4415 QUICKSILVER SPORT 2S

Quicksilver Sport 2S with Rotax 582, E Box, oil injection, electric start, 3 blade, Skydat EIS, ASI, ALT, Black Max brakes, larger tank, tundra tyres. I am selling the aircraft for $30,000, plus Lotus Floats extra $6000. A unique opportunity to buy a low hours, high spec aircraft. Bert 0418 440 575

4417 FOR SALE: SONEX KIT PLANE

Tricycle Sonex kit includes: Engine, Prop, Baffle kit, EGT, CHT and fuel probes and Instruments. Kit contains canopies, Interior & glass fairings. Components already built: Ailerons, Elevators, Rudder& Vertical fin. Horizontal fin close to completion. Aft fuselage approx 40% constructed. Left wing has also been started. Asking price $26,500. Phone: (03) 9738 7100

4418 ESQUAL VM1 C/F KIT

Privately imported Esqual VM1 C/F Kit with Jabiru engine mount . We have decided not to continue with the project. The kit is in a Melbourne warehouse and offers should be made taking into account that the purchaser is to collect the kit. Enquiries and offers are made at hallspj@yahoo.com.au

4423 CESSNA SKYCATCHER 162

Cessna Skycatcher 162, 2012. Airframe 250hrs, Serial No 1600198, Rego 24/8182. One Owner since new. Purchased June 2012. Optional Extras Include second MFD, Sun Visors, Intercom, EGT Sensor, External Power Receptacle and Macaulay Aluminum Propeller. Located Tara, Qld. Price $132000 (GST Inc). Contact Andrew Crowe 0428 657 014

4425 THATCHER CX4 PROJECT

Abandoned project, wings built, Westbery tail plane kit, fuselage, bulkheads, tail wheel kit, aircraft spruce hardware, extruded alum, alum sheets, nothing to spend on airframe $7000 ex Caboolture may assist with freight ph 0434 515 628

4430 LIGHTWING GR 912S

Lightwing Gr 912s Af 480 hrs engine 480 hrs Bolly 3 blade prop VHF UHF GPS with external aerial Heliview instrument panel (alt asi vsi rpm oil pressure oil temp cht volts) Safe and reliable aircraft in excellent condition that has always been hangared. $50 000 phone Clayton 0428233881

4435 X-AIR STD

Electric start, doors, Microair VHF radio, intercom, 2 X headsets, standard instruments. 0412 576 130

4440 WANTED 582 ROTAX

I need an engine under $2,000 if I can manage it, Contact me Warren on 0412 013 061

4441 SONEX ACCIDENT DAMAGED

Sonex, taildragger, 3300 jabiru, bolly prop, accident damaged, easy repair, call for details.$25,000 Contact Tony on 0400 610 076

4445 JABIRU SP500 6 CYL

Great little aircraft, excellent condition, factory built, 6 cyl engine,100 wet wings, standard Jabiru instruments, Garmin GPS, always hangered, recently completed 100 hourly by Jabiru Bundaberg, aircraft is located near Kilcoy. Contact John 0402 133 742.

4447 HANGAR RENTAL RYLSTONE NSW

Hangar rental available at Rylstone Air-park. Concrete floor, insulated with kitchenette. Full details at: http://tucano-replica.blogspot.com.au/2014/07/hangar-rental.html Contact owner (02)9622 1916 AH

4452 KARATOO J6

Total Hours: 609 Engine Hours: 334 Rego: 19-3114 Price:$26,000 Subaru EA81, Rotax type "C" gearbox and Warpdrive 70" 3 blade prop. Tacho, VSI, ASI, Alt, Oil temp and press, Coolant temp, Ammeter, Hourmeter, Fuel press, Icom A200 radio, Intercom. Superflight paint. Hangared at Cessnock NSW. Phone Chris 0419 486 125

4454 AIRSTRIP PROPERTY

10.6 acres with 600mtr airstrip 12klms east of Warwick QLD.3 bed brick/tile home,large hangar/workshop with 3 bay livable shed ajacent. Other car sheds/stables etc.Tractor & machinery included. See googlemap, 54 Freestone school rd Freestone 4370 ph 0466 966 259 or email pilot00lw@hotmail.com for photos $449,000.

4460 JABIRU 230D

2010 factory built J230D. Only 129 hrs. Dynon 180 EFIS. Microair Transponder. Garmin 495 GPS. ATR500 Radio. Cabin Heater. Leather seats. Always hangared. Serviced every 25 hrs by L2 Maintainer. Excellent aircraft in new condition. Cruise 120 kts. Located at Wedderburn Airport Sydney. $77000.00. Phone Michael Sladek 0418 111 787

4461 AIRBORNE XT-912 REG 32-5399

AirBorne XT912 Tundra. 186 Hrs. Always hangared. Serviced every 25 hrs. Microair radio. Streak3 Wing. Skydat GSX display. Tall windscreen. Two headset/helmets & all protective covers for Xcountry adventures. Passenger training bars.
Free fully enclosed trailer included for purchaser.
Phone Michael Sladek
0418 111 787

4462 STEAL A LIGHTNING

Jabiru 3300 engine Sensenich Carbon Fibre Ground Adjustable Prop Grand Rapids Sport SX EFIX Including Auto Pilot Grand Rapids EIS System Garmin VHF Radio SL40 Garmin Transponder GTX327 Garmin 695 Colour Moving Map GPS Intercom - PM1000 II Kanad ELT Solid Mount ASI Compass Electric Flap $65,000 aussie258@bigpond.com ph.0413 935 620

4463 MURPHY REBEL

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4478 THE ORIGINAL MK1 SHUTTLE

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Web www.theabingdonco.com

OFF THE SHELF

New Lightspeed Sierra headset

Lightspeed's entry level ANR aviation headset has just become better value. The company has added enhanced Bluetooth audio capability to the Sierra model, making all Lightspeed headsets now fully compatible with Bluetooth cell phone, music and audio alerts from aviation apps.
Plush ear seals and sturdy fibre reinforced polymer construction add to the Sierra's durability. A reversible headband design allows microphone placement on the left or right.

Price N/A for the new model -original costs about AUD$999.00
Web www.lightspeed.com

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Marvel should be used in the fuel at every fill-up. Use 4 ounces for every 10 gallons of fuel.

Price AUD$105.00 per gallon
Web www.skyshop.com.au

The Diary of Jack Flyer

AUTHOR: TIM HEYLBUT **BY BRIAN BIGG**

Tim hails from South Australia. According to the blurb at the back of the book, he's been a flying nut like the rest of us since he was six years old, when a friend of his uncle gave him a go in a hang glider.
His first ultralight was a Bunyip but he currently owns a LightWing and a 1916 Nieuport.

The diary of Jack Flyer is a novel about a self-taught Australian ultralight pilot. It is set in the years before the AUF and through its beginnings, back in the days when we weren't allowed to go above 300ft, across roads or over towns.

It is a tale of Jack's experiences as written in a diary found by his son in a hangar down the back of Jack's farm. It's a happy tale about learning to fly without rules, back in the days when no one knew anything about what worked or what didn't. It contains a lot of what makes our light end of the business such fun.

For anyone who can remember when ultralight flying in Australia was wild and woolly, this will be an enjoyable read.

Price: $28 plus postage ($7)
Web: http://flyerme.simpl.com

Sport Pilot has a signed copy of *'The Diary of Jack Flyer'* to give away. To win it, be the first to email editor@sportpilot.net.au and tell me the official cruising speed of a LightWing SP2000. Remember to put your postal address on the email.

Statistics

50
The number of multiple choices questions in the new L1 maintenance exam

40
The number of those questions you need to get right to pass

3HRS 30
The time limit for the exam.

Source: See under Technical on the website

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Current location is at Geraldton, WA.

Kelmac Aviation/Mid Western Recreational Flying Club

For more information: Geoffrey McDougall

Ph: 0400 760 778

HAPPY LANDINGS

Lachlan loves lighties too

BY STUART MACGREGOR

Here is a picture from last Sunday over Port Noarlunga (South Australia) with my five year old son, Lachlan. He loves going for a fly and, although I prefer to fly the Sports Cubs at Aldinga Biplanes, I always grab the SportsStar when we head out.

I'm really enjoying RA-Aus flying after many years of heavy metal and I think you see by the grin, the joy my little man has when he gets his hands near the joy stick.

Lachlan loves going for a fly

Got an aviation moment you'd love to share? Your kids or maybe your club get together? Send a photo as a jpeg attachment and a short explanation to editor@sportpilot.net.au

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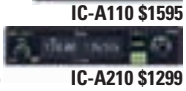

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