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OCTOBER 2014 VOL 39 (10)

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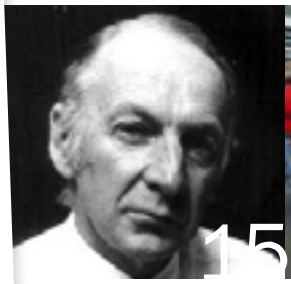

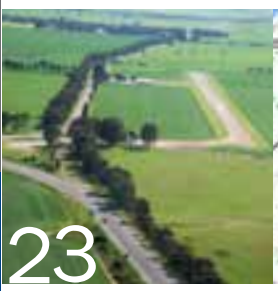

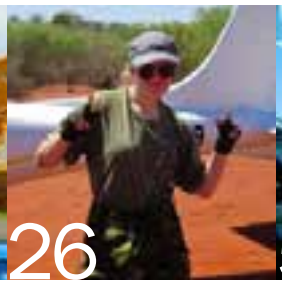

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President's Report

MICHAEL MONCK

A mixed bag

THIS month I find myself in the pleasant position of not having much to report. It's a refreshing way to be given recent months. So I will take the opportunity to reflect on the past year and provide an update for those who will not be able to join us at the AGM. It's a mixed bag of topics, but I think most will agree that overall we have had a positive year.

When I came onto the board in September last year it was a time of turmoil and RA-Aus had many difficulties to overcome. These included dealing with numerous demands from the regulator, sorting out registration issues and generally getting our house in order. I'm proud to say that 12 months later we have sorted out many of these issues and, while we have a long way to go, our future is looking much better.

We have experienced much change over the year including changes in Ops and Tech Managers, the appointment of a National Safety Manager, the hiring of new Assistant Ops and Tech Managers and we have also welcomed aboard a part time Project Officer to oversee progress on a few things.

Jill Bailey and Darren Barnfield have done great work for your organisation since their appointment as Ops and Tech Managers respectively. During this time they have worked on revisions of the Ops and Tech Manuals (to be released soon) and addressed many of the shortcomings which held us back in previous years. They are now accompanied by Neil Schaefer and Jared Smith in their respective teams who provide much valued assistance.

Katie Jenkins has made significant progress on our new national Safety Management System aimed at reducing the number of accidents and incidents in our sport and educating pilots and maintainers on safety related topics. Steve Curtis has provided invaluable assistance for project management and general business improvement.

Of course, we have also had a change at the very top of our management team with the appointment of Michael Linke as the new CEO. Michael's tenure will have only been for three months by the time you read this, but he has already made substantial improvements.

All in all, this team has pulled together to overcome some of the challenges we face as an organisation. Possibly the most visible of these were the registration problems which led to notable delays for aircraft owners. We now have the process time down to something measured in days, not weeks, which is refreshing. This has been the case for a number of weeks now so we are confident it is sustainable.

There is also an in-depth and ongoing review of our finances which will result in more changes, all designed to protect and shore up the future of RA-Aus. These changes will speed up and streamline the way you deal with the office, but they will also result in more value being added to your membership. As they are rolled out they will be communicated to you in more detail.

Speaking of communication, this is something we have done poorly. Even during my time on the board we have found ourselves snowed under with so much work we neglected to communicate with members effectively. I have two things to say on this front. Firstly, I apologise on behalf of myself and the board for allowing this to happen. Secondly, we now have a system in place which will allow us to communicate via email in a timely manner. If you haven't already done so, I would urge you to contact the office and update your contact details so we can stay in touch more easily.

Many of you will also be aware we are working on new training programs to help members maintain their aircraft. Again, due to events throughout the year, this has slipped but there will be more news on this shortly. In the near future we will have a program available to members to improve their improve their maintenance skills and the safety of our fleet.

We have many more challenges ahead of us in the coming year and I am confident that with the new team in place, together with a solid strategic plan, we can overcome any problems. I am looking forward to my second year on the board, during which we can build on the foundations we have laid over the past 12 months and begin to deliver even more value and benefits to the membership. I hope you'll join me during this time and help us grow our sport even more.

Fly safe.

Calendar of events

4 October

Port Macquarie Fly-In and Fly & Spy

Hastings District Flying Club invites all aviators to beautiful Port Macquarie for a weekend of aviation fun and fellowship. On Saturday take part in the Fly & Spy observation trial. Fly and Spy involves teams answering questions as they navigate a course in the local area. $600 in prize money. Food and drink available. A welcome/presentation dinner in the clubhouse Saturday night. For more information, Rod Davison roddi194@yahoo.com.au or 0419 632 477. www.hdfc.com.au

17-19 October

Tamworth Festival of Flight

The second Tamworth Festival of Flight will feature an even more spectacular show of aircraft - from cutting edge to classic - as well as aerobatics, skydiving, joy flights and career advice. All funds raised will be used to support the local community. There will also be a special careers day as part of the festival.

For more information James Hollinworth 0423 913 755, jhollinworth@yahoo.com or Web: tamworthfestivalofflight.com.au.

25-26 October

Jacaranda Muster

Aircraft from around NSW will fly in for Grafton's biggest weekend. Trial flights and refreshments available. Complimentary flights over the city are provided to the Jacaranda Queen contestants on Sunday to view the jacarandas in full bloom. No landing fees and ample parking/tie down, underwing camping. The club has a bunkhouse, kitchen, toilet, hot shower and 'Veranda of Knowledge'. 900m sealed east/west strip or 1,200m grass. The strip is within walking distance of shops, restaurants, pubs and clubs. The nearest Avgas is Lismore or Coffs Harbour but it is only a short distance to Mogas facilities. Transport into the city available.

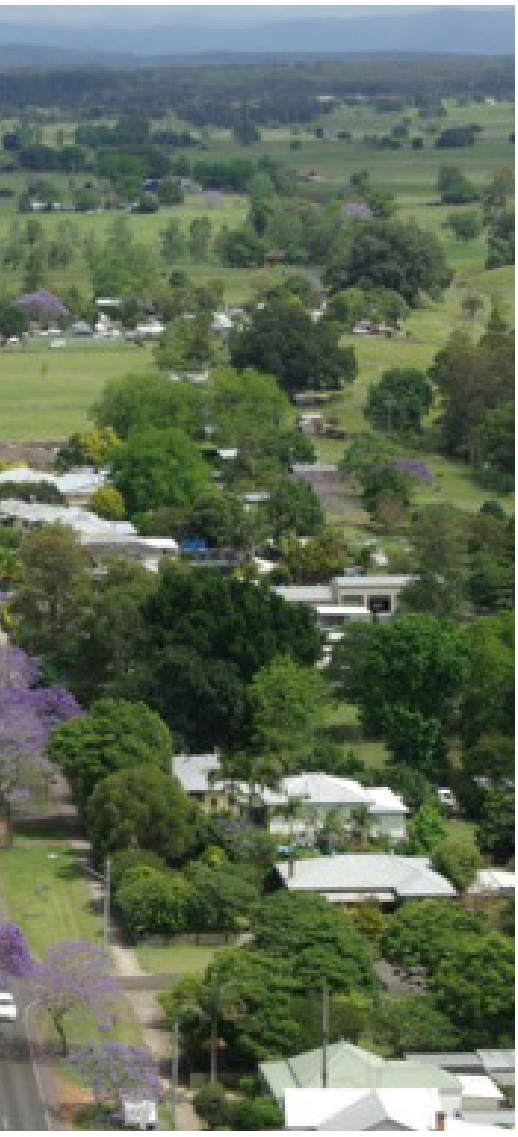
For more information, Kevin Wilson (02) 6649 1853, Col Redding 0428 664 985 or graftonaeroclub@gmail.com.

25-26 October

Mac Air Race Commemoration

A series of events around Albury to mark the 80th Anniversary of the 1934 MacRobertson Air Race, billed at the time as the World's Greatest Air Race. People in Albury helped rescue a competitor, the 'Uiver' which became lost in bad weather. There will be a series of events over the weekend including a vintage car rally, an airport family Open Day, the Albury Racing Club's Cox Plate race day (with an Aero Club fly-over), a dinner featuring Captain Richard de Crespigny of QF-32 fame and the local model plane club's amphibious flying event at the weir. DC-3 owners have been invited to bring their aircraft along as stand-ins for the 'Uiver'.RA-Aus members are also welcome to fly in, remembering it is Class D controlled airspace.

For more information, Michael 0422 487 268.www. http://www.visitalburywodonga.com/event/uiver-80th-anniversary.



1 November

Clare Valley

The official opening of the new aerodrome will take place at a ceremony beginning at 2pm conducted by Richard and Peter Champion de Crespigny. Fly-in registration $20, dinner $80.

For more information, cvaopening2014@gmail.com, Tony Smith 0407 718 045 or Peter Eaton 0417 997 512.

9-11 January 2015

Great Eastern Fly-In

The Great Eastern Fly-In at Evans Head has become the must-see aviation event on the flying calendar. Pilots, their families and friends fly in from all over to enjoy a great summer holiday with a difference. This year the GEFI will celebrate 100 years of military aviation in Australia. The Aviation Heritage Museum has new displays, get up close to the F1-11 and, for the first time, there will be a 737 flight simulator for you to try.

For more information, http://www.greateasternflyin.com.

1-2 November

Back to Holbrook Fly-In

Holbrook Ultralight Club invites aircraft owners and pilots to Holbrook Airpark for its annual Fly-in. Forums Saturday afternoon, Fly-in dinner Saturday night and hot breakfast Sunday morning.

Trophies awarded at the dinner. Underwing camping and transport to and from Holbrook township for accommodation and fuel.

For more information, www.holbrookultralightclub.asn.au or Bryan Gabriel (02) 6036 2601.

15 March 2015

Darling Downs Fly-In

The Clifton Airfield (Bange's) fly-in has become an iconic event in the region and is the premier attraction for all types of aviation in southern Queensland. Come late pm Saturday 14th for BBQ, drinks. Fly or drive in, see ERSA. On field camping, bring your swag. Advise for catering. For more information, Trevor Bange 0429 378 370, (07) 4695 8541 or trevorbange@bigpond.com.

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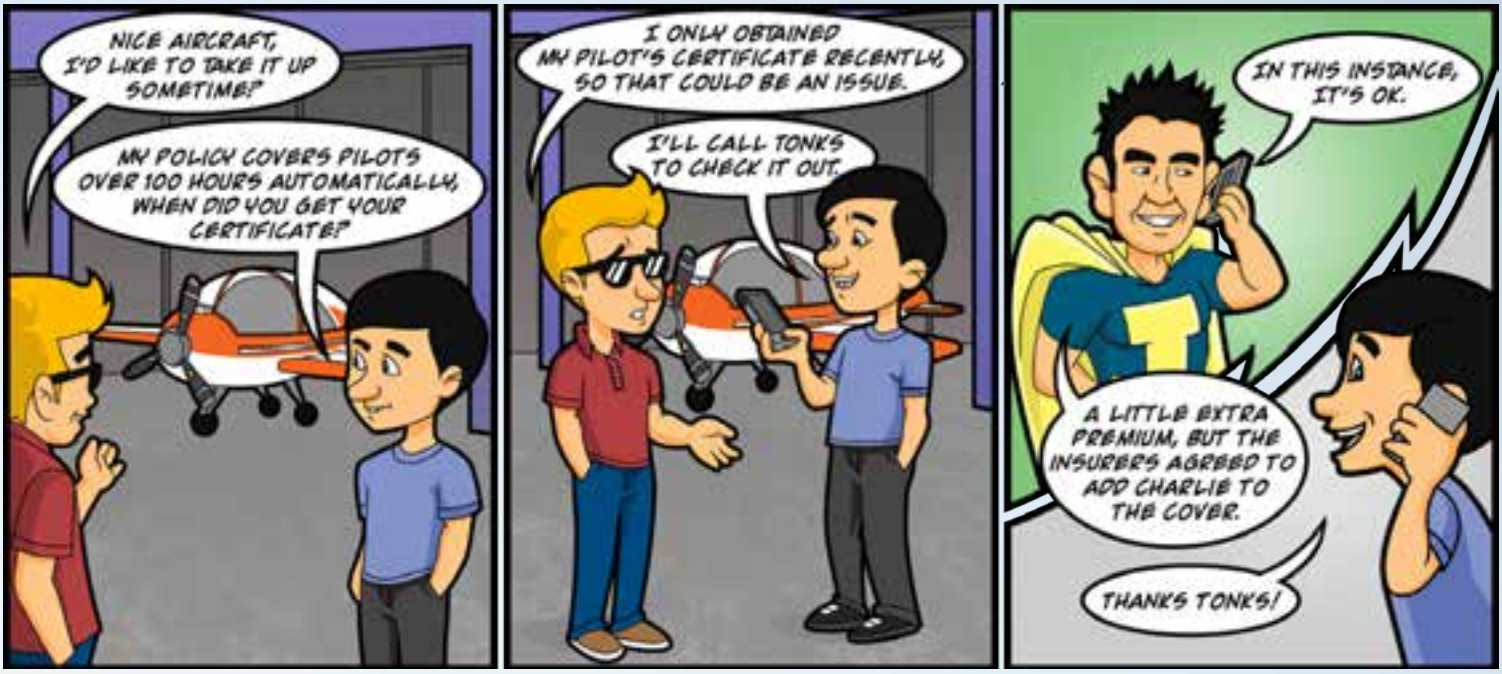

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LETTERS TO THE EDITOR

User pays?

At the RA-Aus NATFLY General Meeting, Treasure Jim Tatlock announced that RA-Aus was in serious financial jeopardy. We were told that last year RA-Aus had an operating loss of $261,195, and this year the deficit was predicted to be about $440,000. Extrapolating these losses into the future puts RA-Aus completely out of business in just three years.

RA-Aus administers 10,000 pilots and 3,500 aircraft. CASA only gives RA-Aus a miniscule $100,000 per year towards its costs, which is equivalent to just $10 per pilot per year. Yet CASA administers GA with no annual fee for pilot licences or registration. The gross unfairness of this situation is patently obvious. RA-Aus is saving CASA millions of dollars each year.

On top of the costs we already have, CASA is forcing RA-Aus to introduce a Safety Management System. CASA's own figure for this exercise is $2 million per year operating across their 300 odd schools. It is not unreasonable, then, to think that RA-Aus with its 174 schools will have to pay costs of around $1 million. This amounts to $100 per RA-Aus member. Nobody is arguing against better managed safety but this represents a further financial burden to RA-Aus which is not being imposed on GA. Negligible additional funding is on offer from CASA to cover this.

If RA-Aus becomes insolvent, there will be a massive burden placed on the public purse when CASA is forced to pick up the cost of administering an extra 10,000 pilots and 3,500 aircraft. Based on an estimate of CASA salaries and other costs, this could be as much as $10 million a year. Compared with that, a modest contribution from CASA towards the reasonable costs of RA-Aus would have to seem like the bargain of the century.

As a financial entity, in 2012/13, CASA spent around $172 million, yet earned only $20 million. GA, as a user pays service, funds only 11% of its costs. The government gives CASA almost $43 million through grants and a further $121 million through aviation fuel excise (it's worth noting that some of this excise is earned from RA-Aus members). Of this huge amount of money, RA-Aus gets a paltry $100,000. Basically, we get about 0.06% of the total budget for CASA and are forced to fund, through a user-pays model, the vast majority of our own activities, despite offering significant value to the government. The unfairness of this situation is palpable.

The truth is that RA-Aus is a very much more cost-efficient organisation than CASA could ever hope to be. The simple logic of CASA helping to keep RA-Aus financially viable is indisputable.
Arthur Marcel

National Safety, Risk and Compliance Manager Katie Jenkins - *CASA has just confirmed that an organisational SMS by RA-Aus will be sufficient for requirements. Therefore each RA-Aus Flight Training Facility will not be required to create and administer an individual SMS. This is a significant win for the organisation and will also permit me to focus on other safety related matters.*

CEO Michael Linke - *We are working hard to try and increase funding from CASA and the points raised are exactly what we've been saying. But we are not optimistic in the current economic climate. We are also reviewing internal processes and member services to see where we can save or generate additional revenue.*

Changes needed

The board structure set out in the constitution is outmoded. We are handicapped with a 30 year old constitution for appointing and operating a board of directors, which is now inappropriate for our size.

Members have to vote to approve changes. To update this, the constitution has to be changed and to allow that, members have to vote for the changes at a meeting.

The old concept of state representation is now unnecessary in the age of advanced communication. State representatives are often bypassed to obtain more direct results.

Twice a year board meetings don't address state problems. The meetings hardly address the needs of pilots with urgent problems to solve. Pilots now directly contact the people they need. The board should meet monthly, not twice a year to plan, control and review progress.

State based directors cannot attend monthly meetings. State directors are volunteers working for a living and cannot afford the travel time to properly administer RA-Aus. We shouldn't ask them to.

The election and operation of the board with travel and accommodation is costly. For two meetings alone, a quote given was around $100,000 per year. For monthly meetings how much extra would this be?

The board has too many people on it for decisive decision making. It wastes time and bogs down with too many inputs. Research shows five is the optimum level for a quorum, but seven members allows for operation in case of absences. Fewer directors mean lower costs, as well as faster and better decisions.

To be able to meet monthly, the directors need to be geographically close to RA-Aus headquarters and to CASA for communication and input.

Professional directors are needed.

We want and need the best. The board needs active professional directors, independently selected for their skills and initiatives.

The constitution has to be changed to allow for appointment of directors. Like shareholders, members can always vote to fire the directors.

How to make a start? Having achieved approval for the constitution, the initial selection of directors has to include them being flexible enough to be able to spend the time and travel necessary for monthly meetings. There may also be other very skilled directors within our membership willing to come forward if needed. Seven has to be the limit, with a quorum of five for meetings. Longer term, specially qualified paid positions may need to be introduced.

Our financial future is now dependent upon fully professional management at all levels. This makes us creditable and influential with government, gets us the best concessions and services and contributes to safe, pleasant and hassle free flying.

Ask your director to urgently change the constitution and set up an extraordinary general meeting to get the changes approved.
Barry Wrenford

CEO Michael Linke - *I think everyone agrees RA-Aus is due for constitutional reform. This is a keen area of focus for me, the Executive and Board. It is both complex and will require some time. Stay tuned as we consult with members in this area.*

Dodgy endorsements

In response to Rick Heinson's Letter to the Editor "Taildragger Claims" (*Sport Pilot* July 2014) I would like to say how unprofessional and unacceptable it is that an RA-Aus FTF would even contemplate offering to a potential student such a sub-standard way to obtain a taildragger endorsement.

The RA-Aus Ops Manual part 3.04-32 clearly states the requirements for obtaining a taildragger endorsement and training must be conducted in a dual control aircraft. Unfortunately Rick didn't contact me, because if he had done so, I would have been able to both advise him of what was required and provide his endorsement in accordance with the Ops Manual.

I have also heard of the FTFs which offer to watch a taildragger student "run it up and down the strip until you are game to pull the stick back" and I know a pilot who actually received his taildragger endorsement by doing exactly

that. It is totally inappropriate and not legal. If an accident occurred and the insurance company became aware the endorsement was not issued in accordance with the Ops manual, any claim would be denied. Not only that, it is a very dangerous situation because there is no way any pilot is competent to fly a taildragger without proper dual instruction.

I would hope Rick provides the names and details of these dodgy FTFs to RA-Aus so it can ensure they adhere to the standards set out in the Ops Manual. Those FTFs should be audited and their taildragger students contacted and asked how they obtained their endorsement. If they admit to not having received dual instruction they should be made to redo the endorsement.
Paul Hewitt, Sport Pilot Flying School

Operations Manager Jill Bailey - *Our organisation must conduct itself in a professional manner at all times and this letter reminds us about the bad old days of the AUF when a wink and nod would gain members privileges without the appropriate training. We encourage members to vote with their feet if training is not provided at an appropriate standard. The responsibility for the delivery of training rests with the delivering instructor and CFI. Any member who chooses to accept substandard training in order to gain a qualification is only fooling himself and may ultimately pay for the privilege. Conversely any pilot who feels that the training provided does not allow them to competently manage the aircraft, should seek alternative training from a different source and advise RA-Aus Operations of their concerns.*

24 Rego and Rotax question

I'm writing to seek clarification on what I think will be an important issue for anyone who owns a factory built 24 registered RA-Aus aircraft with a Rotax engine or is considering buying a second hand factory built 24 registered aircraft with a Rotax engine (I'm in the latter category).

I was always under the impression a 24 registered RA-Aus aircraft (used only for private non-commercial use) could, when its Rotax engine reached its TBO, still be operated and flown (On Condition) as long as the compression on its cylinders was still within specification (as per the Rotax manual) and the engine was in good safe operating condition. I heard stories of many Rotax 912 engines reaching 3,000 hours or more before they needed to be overhauled or replaced.

I recently visited Rotax Australia and was advised this wasn't the situation anymore. I was told that under RA-Aus rules, all 24 registered aircraft and their engines needed to be operated and maintained as per the manufacturer's recommendations. Rotax now lists not only a maximum TBO time in hours for each of its engines but also a maximum number of operational years the engine can be used before it needs to be overhauled.

If this is correct, many of the 912 engines in Australia may now have already reached their maximum operating life in years, irrespective of the number of hours they have done.

In theory, a 912 engine which may only have done 500 hours, will now need to be either overhauled or replaced (if the aircraft is to remain legal and insured) if, according to its serial number, it has reached 10 or 12 years or older.

I'm looking at buying a second hand factory built 24 registered aircraft with a Rotax 912 engine. In a lot of these aircraft, the engines are close to, or have already exceeded, their TBO hours and their maximum life span. But the current owners assure me the aircraft are still legal and can be flown for private use (with the engines being On Condition) as long as all the cylinders pass a pressure leak down test and the compression is still within specification as per the Rotax manual.

If what I was told at Rotax Australia is correct, this would have a huge impact on the selling price of any second hand 24 registered RA-Aus aircraft if its engine has reached its TBO hours or its end-of-life in years. The cost of overhauling a 912 is approximately $18,000 (or $22,000 to replace it with a new engine). Any owner of a recently purchased second hand 24 registered RA-Aus aircraft would need to incur these costs if the aircraft is to remain legal to fly and be insured.

A clarification on this matter would be much appreciated.
Mark Harris

Affordable aviation

The Forsyth Review into Aviation Safety contains a most interesting graph on page 10. It shows the hours flown per year for different aviation sectors e.g. GA, GA training and Recreational.

GA peaked about 2009 and has been falling ever since. Recreational aviation peaked a year later in 2010 but is now falling faster than GA. The decrease in both GA and RA is even more dramatic if population increase is factored in.

This is a spiral dive which needs urgent corrective action.

Why the trend into aviation oblivion? Many reasons no doubt - global financial crisis, a decrease in middle class disposable income, increasing house prices, inaccessible airports, the ASIC farce - but there are also important human factors.

Such as the need to have an aviation law degree to untangle the CASA strangling red tape. Try deciding if a GA pilot with an RPL and an RA-Aus Certificate can fly an RA-Aus 'approved' aircraft, maintained by an L1, with an engine with only some serial numbers approved, in controlled airspace that is, in fact, restricted airspace where ATC is happy to give a clearance.

Such as the hostile attitude of some flight instructors who now are no longer your friend but your examiner with a positive incentive to increase utilisation. How many bad experiences lead to the purchase of a jet ski or 4WD instead of a recreational aircraft?

Such as the increasing expense of obtaining a licence or certificate, indicated, for example, by the number of hours before solo. In the 1960's it was about 10 hours to solo, now it seems to be 20 or more.

Such as the arrogance of the industry regulators with ramp checks, BFR's and the attitude that to fly is a privilege (which we can grant you) and not a right. This is now incorporated as RA-Aus policy (Pilot Talk, *Sport Pilot* August 2014). A reading of both the Australian Constitution (and Magna Carta) clearly spells out the citizens' right to trade, travel and navigate without undue hindrance.

It is interesting to note US AOPA has an active political campaign to reverse the trends. It has even conducted a survey to find friendly training organisations, where the customer has some rights, to assist its members in selection of a training venue.

Thank you Warren Truss for starting the process of bringing the many uncontrolled forces that seem hell bent on destroying Australia's once great aviation history back under control.

Let's get back to safe affordable aviation through a belief in individual responsibility fostered by a facilitating Civil Aviation Authority, client orientated flying schools and clubs and an objective attention to aviation safety.
David Packham

Operations Manager Jill Bailey - *References to the privileges of flight pertain to regulations under the Aviation Act. RA-Aus does not exert further influence of this point or have policy pertaining to this. The use of the reference was included to stimulate thought on self-administering disciplines in line with responsible pilot attitudes and behaviours.*

Weather cameras

I am not sure if many other pilots use weather cameras, however I have found them very useful at times.

I thought RA-Aus may like to forward this address to its members to see if they wish to help. https://www.kickstarter.com/projects/1650021102/australian-weathercam-network.

As you will see from the site, direct contact would be the only way if the executive thought it

>> Cottage Point on weathercam

worthwhile to help the project.

Obviously the network can do with some help, and it would be terrific if we could get a camera near the Tenterfield escarpment sometime in the future.
John Michell

Thanks John

I want to publicly thank the Holbrook Ultralight Club and Museum, especially John Harley, for helping me establish the provenance of an old prop I bought as a souvenir of my first NATFLY, at the 2008 Narromine Fly Market.

After six years in storage due to shifting house twice, I decided to research its history for a plaque to mount alongside it on the wall at home, to create a bit more interest in it other than 'that's just grumps' old prop'.

Beautifully made of 15 layers of timber, it turns out to be a 1985 masterpiece of American Maple, handmade by none other than Craig Catto in California. The lead to Craig was suggested by John and other Holbrook club members who recognised the characteristics of the prop from my photos. Craig responded quickly to my emails, delighted to see one of his early models resurrected in this way.

Turns out he makes props for Australian Aerobatic Champion, Paul Bennet.

Many thanks John and Craig for your very willing and generous time in putting some history to grumps' old prop.
Paul Smith

Where are the wires?

Three of my friends and the uncle of one of my students have all hit power lines. Net result - two dead, three written-off aircraft and lots of grief.

CASA gives out publications regarding wire strikes and one electricity supplier even advertises in the magazine with the slogan 'Where are the wires?'

Interestingly, when I wrote to that particular energy company and asked where the wires were, they couldn't tell me other than 'visit our website'.

Fancy advertising the obvious—don't fly into power lines - but not tell us where they are.

Let me explain what happened to two of my buddies.

They were flying from WA to attend Avalon. They were only a few miles from their destination when the weather forced them to reconsider their options. A precautionary search and landing in a paddock was the solution. Three passes of the paddock were made but when they were on late final a hidden power line jumped out and grabbed them. Fortunately they walked away unharmed, but the aircraft was totalled.

The power poles were in among a stand of trees and the wire stretched across the clearing they flew through on late final.

The thought occurred to me that with today's databases and advancing technology, power lines could be incorporated into flight planning software. The lines need not show up until you are below a certain height, say 300ft and then they could flash yellow on the screen.

(Or any other manner the gurus developing the software can come up with).

I mentioned this idea to the electricity company and CASA and was given the cold shoulder (must be easier to make fancy adverts rather than actually helping someone).

Bevan from Avplan was quite interested in the idea but he too hit a brick wall with CASA and the electricity companies. It seems these data bases are to be kept secret and you have to keep wondering "where are the wires?"
Gordon Marshall

Operations Manager Jill Bailey - *I was informed each local electricity authority has maps of power line location in each local area, which could be requested by pilots. This could be a first point of contact for members?*

Beware statistics

Without wishing to join into Paul Woods' comment on the hazards of encountering the CASA ramp check monitors at our fly-ins (*Sport Pilot* Letters to the Editor August 2014), a timely warning is necessary concerning Paul's statistics. Single numbers are notoriously liable to being loaded emotionally to prove whatever takes your fancy and road accident statistics often fall into this category – which is why they are often dismissed as mere propaganda.

To have much meaning, the numbers need to be related to some other meaningful number, as a ratio of some kind. A simple back of an envelope check on Paul's numbers shows them to fall into this category. Relate his death numbers to the number of licenced drivers in Australia on the one hand and to the number of active members of RA-Aus on the other and you get a different story.

Guessing approximately 9,500 active flyers and not fewer than five million drivers in Australia and the RA-Aus fatality rate is about 38 per 10,000. The car driver fatality rate is not much more than two per 10,000.

The numbers are very approximate as I have made no attempt to separate driver and passenger numbers, but they do reinforce Michael Monck's oft repeated comments on safety.
David Houston

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).

Aircraft calling

CASA has issued a reminder to pilots about the correct procedures for making radio broadcasts at aerodromes not marked on aeronautical charts.

Under CAR 166, pilots must broadcast whenever it is reasonably necessary to avoid a collision or the risk of a collision. When at or near a non-controlled aerodrome with a common traffic advisory frequency pilots should check their radio is on the published frequency - and listen and broadcast as necessary.

Pilots operating at non-controlled aerodromes marked on charts (but which don't have an assigned discrete frequency) should use the multicom frequency of 126.7. When operating at or near aerodromes not marked on charts use the relevant VHF area frequency. The multicom 126.7 frequency should not be used at these unmarked aerodromes. This is because pilots unaware of the unmarked aerodrome will be using the area frequency and will not hear broadcasts on the multicom.

If pilots are concerned about frequency congestion or believe an unmarked aerodrome should be on the charts they should contact their local Regional Airspace and Procedures Advisory Committee (RAPAC) to seek a change. CASA encourages pilots and air operators to get their aerodromes marked on charts so people can be made aware of the existence of them.

For more information, www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_100058

Over the hump

by Michael Linke

I'M pleased to report RA-Aus is now over the hump when it comes to aircraft registrations.

First and foremost I'd like to apologise to all members affected by delayed aircraft registration. Everyone at RA-Aus understands the frustration this has caused and we have been working hard with our dedicated team of staff to put in place strategies to fix the problem.

These strategies have worked and we are now able to process most aircraft registrations in 10 to 14 days.

To facilitate this ongoing improvement in service delivery, we'd like to ask all of our members to return paperwork in a timely manner to the office to facilitate speedy processing.

It is also important to ensure paperwork is completed accurately and fully to avoid delays. If you have any questions about aircraft paperwork, ring our registration team.

RA-Aus and Willis

RA-AUS is pleased to advise members that, as part of our commitment to delivering an increasing array of member benefits, we have formed a relationship with Willis on insurance.

In Australia Willis employs more than 380 personnel in six offices. Worldwide, the company is the number one aviation broker, so its commitment to the aviation industry is second to none. Willis has a proven track record in providing insurance service and solutions to many large associations and their members.

As part of this relationship, RA-Aus will work with Willis to develop a suite of insurance based products to protect members, their aircraft and associated activities and equipment.

RA-Aus already offers members third party insurance as part of their membership fee. Over time further coverage opportunities will be offered.

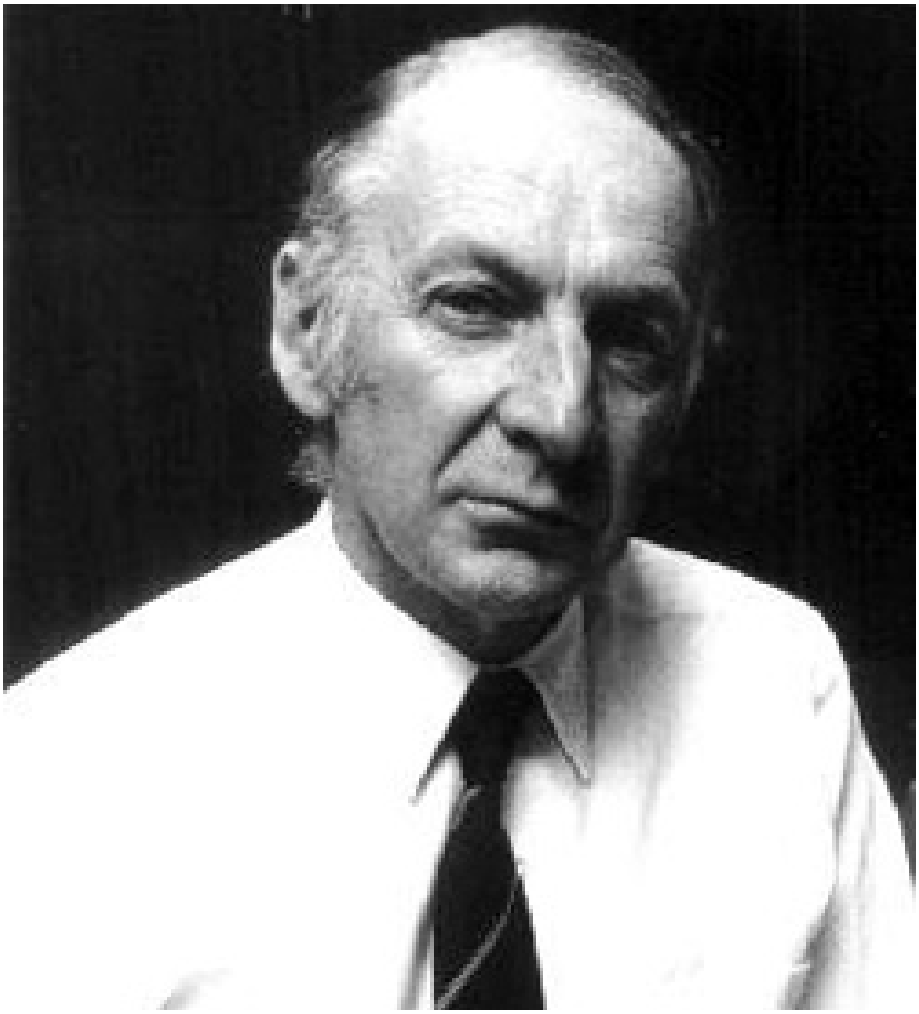
This is just one way RA-Aus is adding value for our members.

Electronic newsletter

RA-AUS has introduced a new communication tool for members. Our electronic newsletter will be circulated every four to six weeks to all members with an email address. All current members with an email address have been automatically subscribed.

If you wish to subscribe, or if you didn't get the first newsletter circulated on August 15, log onto the member's area of the RA-Aus website and subscribe.

The newsletter will contain short stories and notes of interest to members. It will also act as a tool for RA-Aus to engage dynamically with members and seek feedback on a range of issues.



Macarthur Job (1926 - 2014)

by Kathy Mexted

IT'S not easy to achieve living legend status in aviation. But that is how Mac Job was often introduced. To writers who might have been listening, it was recommended they take notes from Mac, who was also the foremost aviation safety expert of his time.

When George Job named his baby son after himself on April 10, 1926 the family determined he be called by his middle name, Macarthur - 'Mac' to avoid confusion. From his home town of Taree, Mac joined the RAAF. A colour vision defect only allowed him a radio technician career, but by the time he left in 1947, he had convinced the powers-that-be to allow him a pilot's licence.

From Tiger Moth trainers, Mac went to Ceduna in South Australia to fly a Dragon DH84, a Percival Proctor III and finally a Lockheed 12A for the Anglican Bush Church Aid Society—a forerunner to the Royal Flying Doctor Service.

His days as a commercial operator at Merimbula focused on fish spotting at Eden and in South Australia, but by 1964 he had taken a job with the DCA as editor of the *Aviation Safety Digest*.

His stamp was to apply the common touch to his work—writing for pilots in their own language—which he did for 14 years as Senior Inspector of Air Safety. The US Flight Safety Foundation named the Digest its 'Publication of the Year' in 1972.

From 1978, Mac was Managing Editor of '*Aircraft*' magazine while acting as Director of the Missionary Aviation Fellowship. A decade later he became a fulltime independent aviation writer focusing on air safety and accident analysis. He published two volumes of '*Air Crash*' and another book, '*The Old and the Bold*.' He consulted with British television for their air safety series '*Black Box*' and with aviation litigation businesses in both Singapore and Australia. In 1997 he won the Aviation Safety Award and AOPA's Bill Adams Trophy. His considerable services to the promotion of aviation safety won him a well-earned OAM in 2003.

He is also remembered for his quest to discover the crash-site of the Kyeema on Mount Dandenong, north-east of Melbourne. After the 1938 crash the government transferred responsibility for Australia's aviation from the military to a civilian aviation agency.

Mac was well respected in the current aviation journalistic community. *Sport Pilot* Editor, Brian Bigg and the magazine's staff, who have had dealings with Mac over the years regretfully acknowledge his passing on August 6, aged 88, after a long fight with cancer.

Electrifying Pipistrel

A NEW 2-seat electric trainer, based on the popular Pipistrel Alpha airframe, had its maiden flight in August. The Alpha Electro has been nicknamed WATTsUP.

WATTsUP was developed in partnership with Siemens AG, which provided the main electric propulsion components. It represents the next generation of Pipistrel's electric aircraft.

According to Pipistrel, every element of the new aircraft has been refined to be lighter, more efficient and more reliable than anything before.

The 85 kW electric motor weighs only 14kg and the company says it is more powerful than the Rotax 912.

The 17 kWh battery pack is dual-redundant and designed to be either quickly replaceable within minutes or charged in less than one hour.

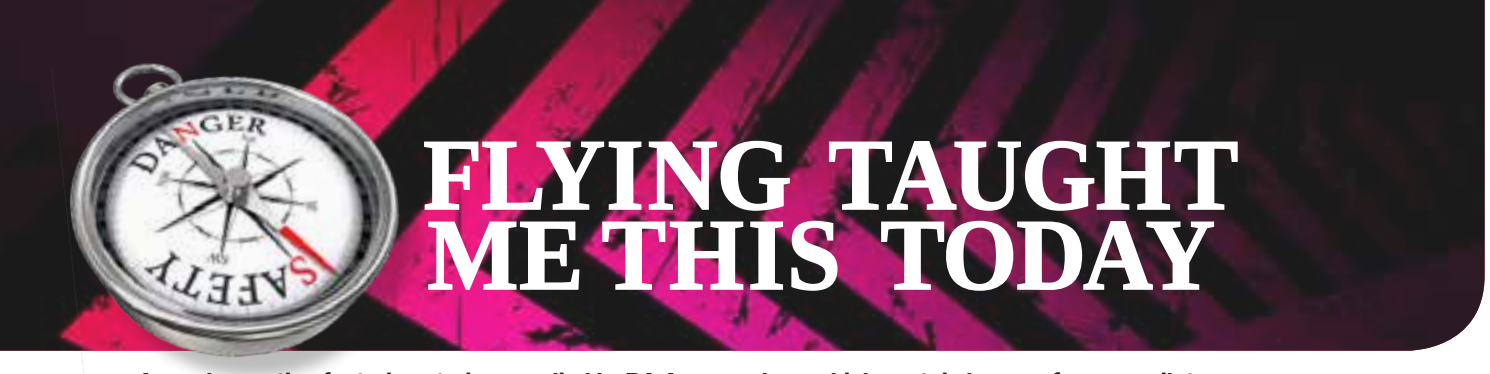
The airframe uses proven features from hundreds of Pipistrel aircraft flying worldwide.

It has a short take-off distance, powerful 1,000fpm climb at MTOW and endurance of one hour plus a 30 minute reserve.

The WATTsUP is optimised for traffic-pattern operations, where 13% of energy is recuperated on every approach, increasing endurance and at the same time enabling short-field landings.

Ivo Boscarol, CEO of Pipistrel says: "Technologies developed specially for this aircraft cut the cost of ab-initio pilot training by as much as 70%, making flying more affordable than ever before. Being able to conduct training on smaller airfields closer to towns with zero CO_2 emissions and minimum noise is also a game changer."

Pipistrel expects to bring the final product to the market in 2015 with a target price below 100,000 EURO.



FLYING TAUGHT ME THIS TODAY

A regular section featuring stories supplied by RA-Aus members which contain lessons for every pilot

Mistakes, I made a few by Basil Buwalda

The first aircraft I owned was a Skyfox/ highly modified Quicksilver II. It was old and just a little bit dodgy. I purchased the microlight from a second hand car salesman, who I shall call Dick. Dick provided an engineer who gave the aircraft an Airworthiness Certificate. (Mistake number one).

The most interesting thing about the aircraft was that braking was achieved by taking your feet off the rudder pedals and dragging them on the ground.

Dick also owned a microlight flying school and employed an instructor who I shall call Johnny. They were to be my first aviation instructors. (Mistake number two).

The service at the school was absolutely shocking and the ethos was all about getting as much money as possible. I use to drive 1.5 hours to the school early in the mornings, only to be turned away when the decision was inevitably that the wind was too strong for my little airplane or that nobody had turned up to take me. For some strange reason I decided to stick with the school, even after I watched Dick get drunk and take to the sky in his own aircraft. (Mistake number three).

My first flight lasted 30 minutes. I was taught the effects of controls and I loved every second. I went solo after six hours of training. I thought I must have been awesome. I got to solo in just six hours! (Mistake number four).

Afterwards, my flying was perfectly adequate and safe, but for some reason I felt somewhat under prepared. So I asked Johnny what happened when the engine stopped on take-off. The response was "You die". Hmmm, I thought. I hope the engine doesn't stop. A month later, I took my aircraft out of the hangar on a beautiful day. At this point I had flown on my own for three hours and enjoyed every moment of it.

This day I was going to do stall training - exciting stuff. I started my ground roll and noticed the airspeed was really slow to increase. I kept the nose on the ground and at 30mph, I leapt into the air.

"Strange", I thought.

The airspeed started to increase to the 50mph range so all was good again. I decided to continue flying. (Mistake number five).

I started my training. I entered the stall, took the power off and kept the nose up ...50...49...48....the nose flopped down, I dived to recover, 48mph, the wind started whistling through flight wires, 49mph, the ground seemed to approach faster than I expected.

I pulled out of the dive and I thought I was going to depart the aircraft through the seat. My face hung in my lap, butterflies abounded. I thought it was strange I had been told the stall speed on the airplane was 35mph.

Fully convinced I had stuffed up somehow, I climbed back to 3,000ft and tried again. Same thing happened.

At this point, my guardian angel suggested in my ear that I should land because he couldn't keep the airplane in the air any more.

I made a perfect landing and came to a stop. The airspeed indicator still indicated 30mph. An investigation discovered a wasp had built a nest in my pitot tube. Only now, can I understand the significance of the danger I had been in.

The story does not end here.

My father and I did maintenance on the aircraft the following weekend, replacing the spark plugs and cleaning her up. She looked like new and I couldn't wait to take her up for a flight the following weekend. I wanted to do more stall training. The weekend arrived and it was a beautiful day. I rolled the airplane out, started her up and taxied to the active runway.

As I rolled onto the centreline, a nut, with a piece of bolt attached, fell into my lap.

Hmm, I thought. Best find where this belongs before I go flying. I taxied off the runway, shut down and inspected the airplane. After 30 fruitless minutes, I decided it must have been in the wing for a while and had shaken loose. I decided to take off.

Three hundred metres above the ground, a spark plug fell out of the inverted Rotax 503. The engine was placed upside down above the pilot's head and the plug hung right next to my head.

I thought to myself "I will have to screw that back in". The engine continued to run on one cylinder, but the airspeed started to bleed off.

I tried turning back to the runway, but lost too much height. My options were either a muddy marsh to the left or a small dam to the right.

For about 10 seconds all I could think was mud... water...mud...water... and I decided on mud.

I did an almost flawless landing, however I ended up with the airplane on my back. The nose had folded up into a 90 degree angle. I was face down in the mud. One minute passed and I decided to get out of the airplane. Which I did.

By all accounts, I should be dead and another statistic for the Darwin Awards. I later found out I had been flying an aircraft with a split propeller, a sheared main wing bolt from my previous stall flights, a broken torque tube in the passenger rudder pedals and incorrectly torqued spark plugs.

I had completely overstressed the airframe due to the previous stall training flights and the blocked pitot tube.

Had I not lost the spark plug, I would have done more stall training and I would have undoubtedly folded the wings 3,000ft above ground.

Looking back I cannot believe how ignorant and stupid I had been.

I took the following lessons from this:

Lesson 1 Don't buy an airplane from someone you do not trust or if you cannot confirm the exact history of the aircraft;

Lesson 2 You are only as good as the training you receive. Do your research and don't fly with fools or cowboys;

Lesson 3 If it all seems too easy, it is most likely wrong! Check what you are being taught. A second opinion can save your life;

Lesson 4 Assume nothing. If it looks wrong, feels wrong or causes doubt in your mind, do not fly. Park it, go home and come back the next day to inspect it with a clear head;

Lesson 5 Just because a problem cannot be found immediately, does not mean it doesn't exist.

This story was first published by RA-ANZ Recreational Pilot E-zine. Basil's blog is at http://blog.equiavia.com

Do you have a story about a near miss or an accident which gave you grey hair but taught you something about flying? The RA-Aus Safety team wants to hear about it. Every story printed in *Sport Pilot* will earn its author a range of RA-Aus merchandise. Email editor@sportpilot.net.au and clearly label your email "Flying taught me this today".

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DRIFTER ADDICTION

by Jim Gollagher

Following a most successful weekend trial of the classic Drifter by Bill and Heather of Caboolture Recreational Aviation, a search began to find a good, reliable Drifter to fill the desire we had now created in our students and pilots.

Bill was determined that if Drifter training and flying were to return to the school, he was not going to rush in and buy just any aircraft. It had to be the right one with the right history. Many of the nominated candidates he looked at came up short, even two trips to Melbourne and another to Grafton proved unsuccessful.

The situation became more urgent when the owner of the L4 Piper Cub on cross hire to the school, asked for his aircraft to be returned. The school has always offered tail wheel and low performance endorsements and the Cub had been the aircraft for that. So the school had a real gap which needed filling. The search for the right Drifter went up another gear.

As luck would have it, sometime later Bill had a conversation with Gympie school operator and fellow CFI, Paul McKeown. Paul mentioned he might be interesting in selling the very Drifter Bill had hired for the trial weekend. A deal was struck and Drifter 1810 rejoined the fleet of training aircraft at Caboolture Recreational Aviation.

Drifter training and private hire hit full swing and 1810 quickly became one of the school's most used aircraft, rarely missing a weekend of activity.

The list of the school's pilot friends and students who have received training and endorsements is constantly growing. Recently a pilot drove all the way from Parkes, saying he couldn't the training in his local area.

>> Tony Rogers and Jim Gollagher heading off into the blue

The Drifter sits proudly on the flight line every day the school is open and pilots and visitors alike are drawn to it, many for their first real ultralight or open cockpit experience.

I will be the first to admit Drifter flying is not everyone's cup of tea and for the uninitiated, the first few minutes can make or break that cup. But those who persist soon become comfortable and go on to experience basic stick and rudder flying while enjoying the awesome view.

The scenery around Caboolture really is beautiful one day, perfect the next, and there is no better place to really appreciate it than from the front seat of a Drifter.

WARNING! Drifter flying is extremely addictive and not recommended for those already suffering acute aviation addictions.

>> Rotating jig for fuselage

>> Rob Tully and Peter Toncek in the assembly area

A classic story

by Prue Tully

FOR the past eight years, our family has owned one of the first Eurofox LSA imported into Australia.

So when a vacation to Croatia came up and a look at the map revealed Slovakia (where the Eurofox is made) to be just around the corner, the opportunity to wangle a look through the factory was deemed worth pursuing.

With a little help from Tony Brandt, of Horsham Aviation, contact was made with Peter Toncek, one of the four directors of Aeropro, which manufactures the Eurofox, and the person there who speaks the best English. Peter agreed to show us through the factory.

The Eurofox story is a classic. The four directors have known each other since they were 10 year old school kids. They made model planes together and, as they got older and their skills progressed, they decided to make a genuine full-sized aircraft. The plane they built was entered in an exhibition. It won a prize and they were approached by several people to make them one.

So began Aeropro. The first year they made three, the second year six and the third year 12. Current production is steady at 35 units a year and Peter believes they have sold a little over 450 to date. 28 of them have found homes in Australia and one in New Zealand.

The aircraft originally used a wooden sparred Canadian wing, but this soon gave way to the fabric-covered aluminium wing seen on all Australian models. Most of the significant developments occurred in the mid 1980's to early 1990's when a lot of work went into tweaking the aerofoil. The plane has remained largely in its present form for the past 15 years.

Eurofox has always used Rotax motors; originally the 2 stroke units and then progressing to the ultra-reliable 912 series as they became available. Interestingly, at the request of two buyers in the US, two were supplied with Australian made Jabiru motors.

The main markets for Eurofox are in the US and UK. The home European market has been hard going recently due to difficult economic conditions. Peter did say the ability for the wings to be easily folded to facilitate storage has proven popular with a lot of buyers.

The tour through the factory was extremely interesting. 20 people are employed in fabrication, assembly and fit out and two in the office. Working conditions and amenities are good, workers even get lunch provided. When I was there, three planes were in an advanced stage of construction. Jigging and welding, bagging and painting were being carried out in enclosed areas adjacent to the main factory floor.

Eurofoxes are produced in tricycle and taildragger configuration and are readily adapted to glider towing. When we were there, the magnificent grass airfield outside the factory had a tricycle Eurofox hard at work hauling up half a dozen gliders on a warm summer's day.

As an owner of a Eurofox, I came away with a warm feeling this company is going to be around for a long time yet, producing a proven, quality product. And it is also a case of watch this space, because waiting in the wings there is a well-developed prototype significantly different to the classic Eurofox.

"This company is going to be around for a long time

>> Peter Toncek with manufacturing steel

A good time in Glen Innes

by James Gresham

THOSE who didn't make it to the Glen Innes fly-in missed an outstanding day. The weather could not have been more co-operative, thank heavens.

After a bit of an undecided start, the wind finally settled down to a gentle breeze favouring the ideal Runway 28. This allowed planes to depart from the intersection and others to land and turn off straight onto the taxiway. It did highlight the bottleneck of our one and only taxiway, with aircraft repeatedly having to pull off onto the grass to let others past.

We had aircraft from Murwillumbah, Inverell, Walcha, Goondiwindi, Stanthorpe, Armidale, Newcastle, Gatton, Pittsworth, Tenterfield, Moree, Casino, Grafton, two from Dundee and probably many other places in-between. We would have been pleased to get a dozen or so planes, but the official count for the day was 28 or 30 (depending on who you ask). The fire roared and the BBQ went flat out with bacon, eggs, sausages and steaks being doled out as fast as they could be cooked. We had catered for 60 people, but by the end of the day we had sold 108 meal tickets. Several quick runs to town had to be made for supplies. By the end of the day, I had done 12 half hour introductory flights.

> *It was really good to see such a wide variety and number of aircraft*

It was really good to see such a wide variety and number of aircraft, RA-Aus and GA, calmly and safely joining the pattern. It was a valuable experience for all our new local pilots who are not used to heavy traffic in the pattern. If everyone simply follows the standard traffic pattern, makes standard radio calls and keeps their eyes open, it all works really rather well.

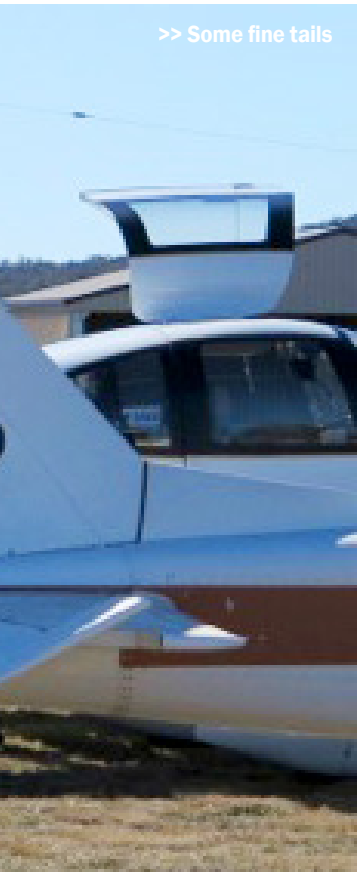
It looks like we might have to make this an annual event, so feedback and suggestions would be great. Thanks again to club members and visitors alike. A great time was had by all.

FLY-INS

>> Some of the 30 aircraft which made it into the Glen Innes Mid Winter Fly-in

>> A Pipistrel short-wing Virus and a Pipistrel Sinus motor glider arrive in style

>> Airport lovers galore outside the club house



>> Some fine tails

>> A young pilot hopeful who had a go in the Foxbat over Glen Innes. And loved it!

Clare Valley up and running

by Tony Smith

THE Clare Valley Flying Group's new aerodrome will be officially opened by Richard and Peter de Crespigny on Saturday November 1.

The aerodrome is located on RM Williams Way, 14kms north of the town of Clare in South Australia. Construction of the main runway (17/35) began in 2010. It is 1,200m long and 18m wide and available for aircraft to 5,700kg. The 600m grass cross strip (09/27) was completed in 2012 at the north end of runway 17/35.

The terminal building is also now completed. It is a glass fronted single storey building offering panoramic views of the runway. It has kitchen and licenced bar facilities with toilet and shower facilities for visiting pilots and passengers.

Two hangars have been constructed by local owners and the aviation business, County Helicopters, has relocated to the field. The completion of the field in only four years was thanks to a dedicated committee and the overwhelming support of local businesses and individuals. The local council and state government also provided grants.

The aerodrome will be managed and operated entirely by the Clare Valley Flying Group Inc.

Why not pop in and visit? For more information on the opening ceremony and Clare Valley Aerodrome, visit www.clarevalleyaerodrome.com.au.

>> What a great place to fly

New airpark for Gympie

by Ray Gresham

ONE of the fastest growing regions of Australia has a new airpark.

Cumulus is situated at Gympie aerodrome. The 1,400m sealed runway with cross strip was built back in the 1960's as a joint initiative of three local shire councils to be the major airport for the region. The airstrip is in rural surrounds, 15 minutes south of Gympie in the pristine Mary Valley at the top of the Sunshine Coast.

The aerodrome has been maintained to a very high standard and the main runway has recently been resealed. Since approval was granted for the construction of the airpark, the first house and hangar has already been completed. Approval has since been granted for the sale of another six blocks.

The blocks are large enough for a house and hangar with room for a pool or tennis court. They all have taxiway access through to the aerodrome.

The Gympie aerodrome is maintained by the council and has fuelling and maintenance facilities on site. It's in uncontrolled airspace and there are no landing fees.

>> Blocks have taxiway access

Brown Ribbon Day a success

by Daphne Gibbs

BROWN Ribbon Day at the end of August was a success all around.

We had 700 bikes turn out, plus a large public attendance. The feedback so far has been overwhelming. People expressed how much they enjoyed the day and how good they felt to be involved in such a good cause.

The Brown Ribbon Day event was staged by volunteers from Geelong's HOGs club and the Geelong Sports Aviators Aero Club to raise money and awareness of the work done by the EJ Whitton Foundation in its fight against prostate cancer.

Golden Plains Aviation and Skythrills had their aircraft available for $20 donation training flights during the day and several other local pilots donated their planes, time and fuel to assist with flights.

As a result of the generosity of people around Geelong, the EJ Whitton Foundation and Andrew Love Cancer Centre will each receive a cheque of $5,760.12.

>> Spectacular sights

>> Generous people

>> And lots of aeroplanes to see

The wrong way round

by James Murphy

MOST people will tell you that if you want to fly around Australia, the way to do it is widdershins, because the prevailing winds tend to give you a helping hand and a few extra knots. But I have never been one to take the easy way and so I planned a clockwise circumnavigation.

I had bought a Jabiru 230D to do some distance flying. I wanted an aircraft which had the legs, speed and range which would make it possible. The big Jab was well suited for the job.

There needed to be some objectives (besides just doing it for fun) and one was to enable my 13 year old co-pilot, Emily, to spend a day in Movie World on the Gold Coast to ride the Superman ride. Four years earlier, she had missed out by mere millimetres, despite wearing a set of high heels to try and make the minimum height.

The second objective was a visit to the Jabiru factory and birthplace of the humble steed which would carry us on our adventure. And lastly, it would be rude not to collect the CAGIT on the way back.

I called Dexter Burkhill who I believed was the current holder of the CAGIT (He had retrieved it from Tasmania) only to find out it had moved on to Swan Reach on the Murray River. Peter and Kerry were now the holders. No problem. We had to go that way anyway.

On departure day, we lifted into the air with the intention of dropping in to Serpentine where they were having a bit of a fly-in. But a few minutes out, the engine started to cough and I went through the "was that a cough or not?" routine until I decided to turn around and head back to the field to find out what was the issue.

It turned out to be the cold start kit, which had been fitted two weeks previously. With the original coil refitted and tested, we were off again.

We headed north with the Indian Ocean shining blue on our left. Once we were clear of Perth's class "C" airspace we climbed above the inversion around 7,000ft into nice smooth air and watched as Geraldton slipped past. The plan was for a stop at Overlander.

The strip there was wide and long and presented no issues on landing. We taxied to the south end and refuelled the Jab from the two 20L tanks we carried.

The next hop was to Carnarvon. We arrived with light to spare at a deserted airfield. The fuel bowser was a BP card only (Only in WA Grrr) so we topped off our tanks from the cans again, found a quiet spot behind the fuel farm to set up camp, then headed into town for pizza.

>> Co-pilot Emily raring to go

>> Going round the wrong way

The following morning we paid our landing fee into the honesty box, (I so much prefer this method) and we were off to Paraburdoo.

The nature of the ground started to change dramatically, with the vast emptiness and foot hills leading into the mountains of the Hamersley ranges. We also started to move out of VHF coverage areas and the silence on the radio felt ominous. We were prepared with EPIRB, SAR, an array of survival equipment and many years of army training, all of which we could fall back on if needed, but hopefully not.

Paraburdoo was just where the GPS said it would be. You do get reassurance from the GPS. It takes away the stress of navigation and it beats the old days of VOR or flying from NDB to NDB.

Paraburdoo is an airfield in the middle of nowhere but it has a good runway and facilities for an airfield serving the mining community. The ERSA said it would take Mastercard and Visa, the signs on the pump also said it would, but it did not. Fortunately the local fuel bloke was very pleasant and came out and topped off the tanks.

Heading north east a few hours later, the sea started to appear on the left and was a very welcome sight. Then we were feet wet over the Timor Sea and the sun was sinking. I tuned in the ATIS for Broome which was our first rest stop. We had allotted ourselves a day off. We found a little curry house, 'Little India', which served one of the best curries I have ever had in Australia.

Refuelling at Broome was interesting. You have to book the fuel bloke and I had to keep reminding him on the phone that I was refuelling today and leaving tomorrow. Eventually the truck turned up and we topped off the tanks. "Have you got a BP card?" No, I said. "There is a 7% fee for a credit card." No problem, I said. I have Visa and Mastercard. "Well, it's still 7%." I'll pay cash then, I said. "7% for cash too, mate." I'm pretty certain you can't charge for using cash. Grrr.

Kununurra turned out to be a whistle stop - a quick landing to refuel and we were off again - as time was running out and we were burning daylight.

We finally passed out of WA. Wow! It had only taken a few days, but it was still such a long way. I had to keep reminding myself the equivalent distance in Europe would be London to Cyprus. We

>> The best curries in Australia

>> Dexter Burkhill (right) helped change the tyre

>> James and Emily with CAGIT in Jandakot

CAGIT now rests in the Royal Aero Club WA display cabinet

had flown over the equivalent of all of Europe!

With time beating wings close on our heels we arrived in Darwin, where we went for the easier option of landing at YMTK. The funny thing is the airfield is actually called Emkaytee (Well, I think it's funny).

From Darwin we headed south east for the first time.

Borroloola turned out to be one of the little gems you find every now and then. An airfield miles from anywhere, but the fuel pump and card reader worked (It was Wi-Fi and you had to start the generator) and it was only a short walk to the local service station for hot food and a nice place to eat it.

Mt Isa was a welcome sight, with the airfield in a long wide valley with the refinery and town at one end. The next day Longreach hove into view after three and a half hours. Then we flew across the Great Dividing Range towards Emerald and on to Bundaberg.

I called Brisbane Centre as we passed the overhead of Thangool to move the SARtime and I was a little surprised when Centre came back and asked if I wanted a radar vectoring and advisory service into Bundaberg. I decided he must have been getting bored and wanted an aircraft to play with. I declined nicely.

The following day I was at the Hinkler Flying School in Bundaberg and chatting with the CFI, Max Jackson. We discussed that it looked like our Jab had a slow leak in the left main wheel. Max said I was a brave man to be doing the flight without a spare wheel. The funny thing is, sometimes it's the obvious things you miss. He was so right. I was going to the factory within the hour, so I decided to buy a spare there.

Then we went to see the birthplace of my beloved Jab and I have to say a big thank you to the Jabiru staff for coming in on a Saturday.

Our next leg was due south. On over Gympie, then the Sunshine Coast and in the distance Brisbane appeared. Around the city we ended up at Heck Field. I have to say The Gold Coast Sport Flying Club was the most welcoming and the best stopover we had on our entire trip and I would highly recommend anyone to pay them a visit. This is how a club should be set up.

After a short hop to Southport the next day, Emily finally got to Movie World and the Superman ride. She loved it.

I called Dexter and started to plan for a landing at his field in Denman. You can only land in one direction (From the south), due to a set of high and low power lines on the northern threshold. On the southern side you also have a high set of power lines you have to land underneath.

It sounds a lot worse than it actually was.

The touch down was smooth and a long way from the power lines, but the Jabiru started pulling hard to the left. I guessed the tyre had blown and applied lots of right rudder, but we continued to skip left and the trees got closer. We stopped with room to spare and discovered that yes, the wheel was flat. It must have deflated in flight. I silently thanked Max for his timely advice. With Dexter's help we had the wheel changed in 15 minutes.

Temora was a wonderful sight with its very long runways. And then we hove into Swan Reach, where Peter and Kerry had been the owners of CAGIT for a month. Their airstrip also had some challenges - you have to land uphill. Peter was waiting for us and after congratulating us, he presented us with the trophy.

The flight back to the club at Jandakot was completed over the following days. Our journey ended up being 5,830nm and took 62 hours 20 minutes.

CAGIT now rests in the Royal Aero Club WA display cabinet.

Come and get it.

AVGAS REPLACEMENTS

by Jeffrey Decker *Sport Pilot* US Correspondent

A MILESTONE in the quest for lead-free Avgas was announced by the FAA on September 8.

Four alternative fuels were selected for testing, out of nine put forward in July for evaluation as potential replacements.

Worries about the toxic effects of lead additives in fuel have been around for decades. Concerns over nervous system damage in humans and harm to the environment led to a ban on its use in automotive gasoline in 1973. Avgas was exempted because there was no viable alternative. In 2007 Friends of the Earth sued to stop EPA allowing Avgas the exemption. Avgas' days were then numbered.

But the question of what would replace it has been a stumbling block. Competing companies, seeing lots of dollars at the end of the rainbow, have been pushing their own fuels, all of which had different standards.

In 2012 the FAA said it would identify a replacement fuel within 11 years. The naming of the four finalists is the biggest step so far towards getting the fractious industry to agree on a set of standards.

For years EAA Governmental Relations Director, Doug MacNair, has been building common ground and now, he says, everyone's ready to go forward on the same page.

"Frankly, we're thrilled to see that because, after 25 years of working on this, we were beginning to get pretty discouraged,"

High performance engines need something other than lead to offer the kick called 100 Octane. Low-compression engines used in ultralights need to get away from lead too.

"Choices have become very restricted," says Doug. "You either need to find ethanol-free autogas or you need to suffer your way through engine fouling using Avgas."

Between 70 and 80 percent of the piston fleet doesn't need the maximum octane performance of 100 LL and many were not designed to use that extra power.

The Piston Aviation Fuels Initiative meets bi-monthly as fuel testing continues at the FAA's WIlliam J. Hughes Technical Centre and as ASTM International creates a new standard for the future fuel.

"Before PAFI set out to create a fleetwide standard", explains MacNair, "All you could do was literally get make/model specific STCs of fuels and none of us would have lived long enough to get through that process."

PAFI members represent EAA, AOPA, the American Petroleum Institute, the General Aviation Manufacturers Association, the National Air Transportation Association and the National Business Aviation Association.

Rob Hackman, AOPA Vice President of Regulatory Affairs, says the 2018 goal for a fleetwide fuel certification is achievable.

"If we hold octane constant and we change other parameters in the fuel - fuel density, how it operates in different temperatures, how it does materials compatibility and a whole host of other things- all of that has to be tested out through PAFI and any effect or change has to be tested out on the airframe," he says.

Additives and refining tricks have been tried for 30 years and they do work but, until recently, they've all been extremely expensive.

Testing of the most promising new fuel blends began in September. Contenders were Afton Chemical Company, Avgas LLC, Shell, Swift Fuels and a consortium made up of BP, TOTAL and Hjelmco.

Of the four chosen by the FAA to continue testing, two have been developed by Swift Fuels, one by Shell and another by TOTAL. Laboratory and rig testing will take a year.

In the FAA Reauthorisation act, the US Congress provided $6 million this year, with another $6 million on track for next year.

Lycoming Engines General Manager, Michael Kraft, says the company has been assisting the FAA's testing program for a long time. "Prior to the PAFI initiative we had been doing contract testing for fuels from different manufacturers."

The objective is to have a fuel which is transparent to the operator, with no disruption of performance, safety or availability.

"We now have to get to work on all sorts of materials compatibility," says Kraft. "It's more elbow grease and tweaks as opposed to having to come up with something new and innovative. We're going to see an ASTM specification this year for the fuel, and then the equipment manufacturers need to certify for use. And then it starts flowing."

Robert Midgley, Global Technology Manager for Shell Aviation, says Shell will be glad to meet any new specification, even as its fuel adheres to the traditional D-910 ASTM fuel specification in use today for Avgas.

"We've got a compositional range in which we can work, so we have options," he explains. "When we go through testing, if we find we need to optimise in a different direction, we still have capacity to do that. Another benefit to meeting the old standard", he adds.

"The testing really starts to focus on the difference between the new molecules, rather than the difference on the performance."

Midgley is confident his company's global resources gives them an edge, with multiple teams bringing research experience from every sort of fuel in use today, such as Formula One racing. "From our point of view we've got a lot of capacity in both the research and the commercialisation end."

For now, the finalist fuels are all petroleum-based. Swift Fuel jumped to an early lead with its proprietary blend using renewable feedstocks for the best carbon footprint and least environmental impact. But the appearance of so many competitors led the firm to swap to crude oil and the lower production price which comes with it.

Jet fuels from biomass like algae and jatropha and a host of other potential green fuel sources are being heavily researched by fuel suppliers, airlines and the military. But turning the feedstocks into hydrocarbons and then into Avgas is much further behind. For now it doesn't seem to be a priority.

The pressure from the EPA on the FAA is being caused by pressure on the EPA for an immediate and total ban on lead based fuel. It has been the subject of a petition from a US Environmental pressure group.

"EPA's delay in making an endangerment finding ignores clear science," says Kathy Attar, Toxics Program Manager for Physicians for Social Responsibility. "The agency is contradicting its own admissions about the health risks of lead and the causal connection between lead emissions from general aviation aircraft and air pollution.

"Avgas-fuelled aircraft are the single largest source of lead air emissions in the US", she says.

The Ops team

400 respond to the engine survey

RA-AUS recently asked on the website if you would participate in an engine survey.

The idea was to allow you to provide your answers anonymously, in an effort to encourage openness and honesty. Some of you asked if you could provide registration details and other information. This will be an option in future surveys.

So far 429 members have responded. Thank you to everyone who has. Everyone else still has the opportunity (for a short time) to complete the survey once this article appears in the October *Sport Pilot* magazine.

Approximately 3,200 aircraft are registered with RA-Aus. The 429 responses therefore represent about 13% of the fleet.

Typical engine types included about one third Jabirus, one third Rotax 4 strokes (912/914) and the remainder made up of Lycoming, a large number of Rotax 2 strokes, along with auto engine conversions such as VW and Subaru.

Interestingly, for the ongoing discussions about the availability for MOGAS at airfields, over two thirds of respondents use MOGAS.

More than half the members do their own maintenance and, very encouragingly, the overwhelming majority adhere to the manufacturer's maintenance schedule. Also encouraging is that the vast majority of members report they had completed all Service Bulletins (SBs) and Airworthiness Directives (ADs) for their engine type.

Almost one fifth of members who responded had suffered an engine failure, which may have been a trigger and motivation for them to complete the survey. Of these engine failures, just over half were the result of a mechanical failure.

A total of 23 members reported they had experienced more than one engine failure and six had even gone through a third one (These may not have all been on the same engine, the survey did not ask that question). The figures may also be explained, in part, by the participation of instructors, who fly a disproportionately high number of hours in comparison to the average pilot.

Most mechanical failures for Jabiru engines related to piston/ring, exhaust valve and through bolt failures. Rotax problems included sprag clutch issues, CDI or electronic ignition failures and gearbox problems. General failures relative to all types include a large number of fuel or carburettor related ptoblems, including a surprising number of fuel contamination issues, electrical failures of various types including charging, cooling system and propeller issues.

> *Almost one fifth of members who responded had suffered an engine failure*

One fifth of the pilots in the survey reported they had detected mechanical failures during maintenance. Of these, only just over one third reported the issues to the manufacturer. Of greater concern, over half did not report issues or mechanical failures to RA-Aus or ATSB. The culture of a lack of reporting has long been suspected, and, while expected, is of real concern to Operations.

RA-Aus is responsible for administering our categories of aircraft but, if a serious issue with a type or engine is suspected, it becomes problematic to escalate the issue with CASA if our analysis is not backed up with statistics.

Encouragingly for members who have expressed safety concerns, further attention to common causes of engine failures has recently been escalated to CASA by RA-Aus, prompted by recent high profile engine failures.

Finally, we would like to pass on our best wishes to those members who have been unfortunate enough to experience an inflight engine failure (or two). Emergency actions and procedures are drilled into every RA-Aus pilot during training and the survey results reveal emergency situations as a result of engine failure resulted in only minor injuries. This shows excellent adherence to training and procedures. It is also testament to the skill level of our instructors and flight training facilities.

We will keep you informed of the progress with the issues outlined above and intend to provide a more detailed analysis and further information once the engine survey is closed and the results fully analysed.

If you wish to take part in the survey, please visit https://www.surveymonkey.net/analyze/6rCkFXDbl4PrqWTrohR04kR744FWptpI9GhRAG8nBE8_3D.

For all the latest results from the survey, visit the RA-Aus website.

>> The GR-LSA has a different shaped and smaller wing

>> The wing area is more akin to the GA 912

I started to feel quite proud of this aircraft

>> The aircraft has larger flaps and consequently smaller ailerons

>> The aircraft shares the same wing shape as the SPEED

Steady as she goes

LIGHTWING GR-912-LSA

by **Howard Hughes** CEO of Hughes Group

I FLEW the new GR-912-LSA for the first time on June 2 at Ballina Airport. The initial flight lasted approximately an hour.

Test flying can be a dangerous activity. When you take an aircraft up for the first time, there are any number of things that can go wrong. Consequently at Australian LightWing, I always approach the task with a great deal of thought and most importantly, prior preparation starting with weight and balance.

This is important for predicting how the aircraft will rotate on take-off, as well as how it will stall and flare for landing. The Centre of Gravity of the test aircraft was measured at 22% of the wing chord and, from the history of this design, this was a conservative figure.

The general procedure is to use the entire length of the 1,900m runway at Ballina and pick as near to a perfect day as possible. On June 2, the wind was light and straight down the strip from the west at approximately 5kts. This eliminated one of the major unknowns, the effect of turbulence on the test vehicle.

The GR-LSA has a number of differences to our standard GR in that it has a slightly different shaped and smaller wing, with an area more akin to the GA 912, about 140sq ft. However it has much larger flaps and consequently smaller ailerons than either the GA or the GR. The aircraft shares the same wing shape as the SPEED, so I didn't expect too many surprises in the actual performance of the aircraft. The GR-LSA has a slightly bigger wing area than the SPEED. The span overall being 1.2m larger, with the wing tips and ailerons remaining the same shape.

Weight and balance of the GR-LSA is more akin to that of the GR 912 in that the CG is 300mm aft of the leading edge of the wing. Anyone who has flown a LightWing GR will know that the stall is a non-event with the aircraft entering let's call it, a mush or a nose high descent, about 500 to 700ft/min. I have always expressed scepticism when pilots of canard type aircraft talk of how an aircraft fitted with a canard or forward stabiliser is a safe aircraft because the canard wing stalls before the main wing. Any standard aircraft can be configured to behave in the same way – it's just a matter of design.

With a forward CG, I expected the weight on the nose or the aircraft's ability to rotate on lift off to be a little heavier than the SPEED, however this was not the case. Flap was set for 20 degrees, the GR-LSA rotated smoothly and immediately assumed a climb attitude. With a rate of climb around 700ft/min at 65kts, the angle of attack was not particularly nose high. This was expected. The small aerodynamic trim tab located on the left elevator worked perfectly and stick forces could be easily trimmed to zero.

On initial test-flying, the normal approach would be to travel down the airstrip a short distance, lift off, then land and check the aircraft for problems. However in the space of a few seconds it was fairly obvious the Rotax engine, the Bolly prop, stick forces, weight and balance and rudder authority were all normal.

Yes, that is a short time to assess all those things, however bear in mind this would be approximately the 180th Australian LightWing aircraft test flown at Ballina, so I was able to make the assessment relatively quickly.

A note of explanation here. Stick force (the force you apply to a control stick or yoke) should increase in a linear way with deflection of the rudder, aileron or elevator. That is, a movement of the stick 10 degrees to the right should result in a small roll to the right and a force applied to the stick of say about 1kg. A movement of 20 degrees should equal a correspondingly higher roll and a directly proportional increase in stick force, say 2kg. If the stick force gets proportionally less, the control surface(s) may be stalling and you have a problem. You could easily lose control of the aircraft. The same applies to the elevator and rudder.

I guess after 28 years of this sort of testing, I've developed a sense for this - call it a nose or whatever. It's not something to take lightly, but it's easy to assess if you have done it before.

In climbing out straight ahead to the west, the further the flight progressed the more normal everything felt, with the stick forces being particularly well harmonised. At this point I started to feel quite proud of this aircraft because it was shaping up exactly as per the design parameters I had set for it.

Best rate of climb was achieved around 60kts, which once again was expected and levelling off into stable flight on the downwind leg from runway 24, the aircraft settled down to an initial cruise assessment about 5,000 RPM at a little over 75kts. Once again this was as per the design parameters. After landing the aircraft, I returned to the hangar and checked the engine for leaks etc before heading out for a second sortie.

During the second flight, I explored the lower end of the flight envelope, where I found stalls were, as predicted, around 35kts with full flap and almost no nose drop. They were particularly uneventful with a nose high descent around 500ft/min with little tendency to rotate the nose one way or the other.

All in all the testing indicated the aircraft behaves as predicted, along the same lines as the original GR-912-LSA. This was, in fact, the idea for this aircraft - to be a bigger, roomier version of the GR 912 of which we have now produced around 150 examples. We believe the GR-LSA will take its place alongside the 80hp GR-912 in farming and surveillance, flight training and recreational flying.


E24-8487

LightWing

GR-912-LSA

So you want to build a runway

by John Smith
Lake Saint Clair

FIRST you have to live in a rural area with enough land to have a runway at least 500m long. It will be difficult in suburbia, what with fences, power lines and neighbours looking over the fence at what you are doing.

The first thing to consider is the local council - do you need to ask their permission?

If you don't (and many people just go ahead and build a strip) and the council receives a complaint, they just might ask you to stop using it.

Then if you don't do what they say, they may take you to court which will be expensive for you but won't cost the council officer a cent.

However, the real problems begin when you do ask the council for permission.

When I was planning my own strip, I rang around a few country councils to find out the correct procedure. The planning officers in each case did not know if a Development Application would be required - most told me it was the first time they had been asked the question. They admitted they just did not know the answer and would have to look into it. One planning officer theorised that if I needed to move or infill with more than nine cubic metres of dirt then it was considered to be a construction and a DA would be required.

Councils can get you on two points. One, it's a construction and Two, it's a change of land use.

On the construction side of things consider the Supreme Court ruling '*Carter v Mid Murray Council*'.

The case concerned the replacement of a graded-earth airstrip with a channel-cut, rubble-filled and compacted airstrip, constructed to a standard similar to an unsealed road. The Court held that upgrading of the airstrip was building work within the meaning of the Act, because it involved the construction of a structure.

The original airstrip was not considered a structure. The difference was that the upgraded airstrip involved work which could fairly be termed 'construction' (such as filling with rubble and compaction) whereas the original airstrip did not. The Court observed that the Act treated the construction of a private road as development and that the construction of an airstrip was similar.

We then have a Victorian Civil and Administrative Tribunal decision –

"Pursuant to section 149B of the Planning and Environment Act 1987 I make the following declarations: (Helen Gibson)

The airstrip on the subject land is ancillary to the use of the land for agricultural and domestic purposes.

No planning permit is required for the airstrip."

However, just because no permit is required and the airstrip has been constructed and is in use, does not guarantee it will always remain suitable for use as an aeroplane landing area. The CAPP 92-1(1) Guidelines for Aeroplane Landing Areas are advisory guidelines to be used by pilots in command of aircraft to determine the suitability of a place for landing and taking off. They have no regulatory status and offer no ongoing protection in a planning sense for an airstrip.

The onus rests on a land owner to construct an airstrip in a location that can retain its suitability for use as a place for landing and taking off irrespective of what may occur on adjoining land. A landowner who constructs an airstrip close to adjoining land cannot necessarily expect to constrain the future use of that land in order to protect the useability of the airstrip.

The situation is different with respect to public facilities, where protection of their useability is justified in the community interest and which is one reason for the Airport Environs Overlay. But a private airstrip is no different to any other private land use. The effects on its use by a competing use or development must be weighed up in the same way as in any other planning permit

>> My little Gazelle

> *The real problems begin when you do ask the council for permission*

assessment.

There will be situations however, where an airstrip may be affected by a development on adjoining land. Thus a landowner adjoining the subject land could build a large shed close to his boundary in line with the end of the runway which, provided the shed complied with the planning scheme, would not need a permit, irrespective of whether it intruded into air space which should be clear of objects as recommended under CAPP 92-1(1).

So on one hand no application is required, on the other if you move the nine cubic metres of dirt, then you do.

My own conclusion is that if you disturb the soil and need to roll it - it is compaction and you need a permit. If you are just returning the soil to its normal state - that is not compaction.

But I have a few questions. If a farmer laser levels his land and shifts a couple of thousand tonnes of soil, does he need a permit? If the same farmer works up a paddock and sows and uses a roller to compact the ground, does he need a permit? If a neighbour widens a track, removes a lot of scrub and builds a two lane road through his property 800m long, does he need a permit?

>> Bow Hill airstrip wedged in between road and lagoon

>> Lake Saint Clair camping ground from 3,000ft

It would appear vehicles are exempt, but if you talk about a landing strip, the red flag goes up. Neighbours have to be asked and agree to it. The EPA may be asked. CASA has a say. But why? We are not landing 747s. The neighbours don't own the air space, so what has it got to do with them? They can drive up and down with old noisy tractors, generating 110 decibels or mowing with a machine rated at 95 decibels, or race up and down the road on motorbikes putting out over 100 decibels. But if I try and fly overhead with a machine rated at some were between 60 and 80 decibels they can get up in arms.

Maybe it's a privacy thing. They don't like the idea of someone looking into their back yard (I wonder what they are doing and why they didn't invite me).

My land is on the edge of a coastal area, so the coastal protection board also has to be asked, even though in the development plan it states 'light recreational use'. I fly a light recreational plane for recreational use, but the council officer reckons they did not mean that! How do you answer that?

RA-Aus must have a small percentage of members who would like to establish their own landing strips. Would it be a good idea for our association to engage a solicitor to look into things, establish a set of guidelines and have the association engage with councils nationwide to make building an airstrip an easier and more predictable project?

>> Me and my bird

Questions about pilot training

ARE pilots trained as well as they could or should be? Personally I don't think so.

by Owen Bartrop

I am a pilot with few thousand hours of flying experience. I joined the RAAF in 1953 and spent the next fourteen months learning to fly. 220 hours later (55 on Tiger Moths, 55 on Wirraways and 110 on Vampire jets) I graduated as a pilot.

My training consisted of day VFR but also navigation, night, instrument, formation, low level and aerobatic flying. Ground subjects took up 50% of the course and we had to learn all about the aircraft we flew, including how the engine, electrical, fuel, oil and instrument systems worked. Stock subjects like maths, aerodynamics, meteorology, navigation, airmanship were also covered.

Having completed this very extensive and difficult course (26 trainees started and seven graduated) I was then posted to an Operational Training Unit where, over the next five months, I was taught to become a fighter pilot.

All that training paid dividends because in 1956 I managed to obtain the highest score in an inter squadron fighter/bomber armament competition making me the Air Force's top gun. I also flew as a member of the Meteorite formation aerobatic team, flying Meteor fighters.

After twelve years of flying fighter aircraft, including two as a test pilot, I then had a non-flying break of forty five years until four years ago when my bucket list dictated that I buy my own aircraft.

I fully understand the training I received is not possible in the real world of recreational flying. But the question still remains - are pilots trained as well as they should or could be?

APPARENT PROBLEMS

My answer, no is based on the fact that over the past four years I have seen some pretty ordinary airmanship, mainly due to inadequate training. I have also read of accidents which should not have happened. We all make the occasional mistake, such as getting confused between left and the other left or calling our position east when we are actually west.

But there are other, more serious examples.

While flying downwind at 1,000ft above the runway height, I noted another aircraft joining the circuit, passing a couple of hundred feet above me. On questioning the pilot about his height, he stated that he was at 1,500ft, that is 1,500ft above sea level, not airport level. There is a difference.

On another day our group of eight aircraft arrived at an airfield at roughly the same time. The pilot of the first aircraft determined the landing direction based on wind direction. The rest of us followed his lead and landed in the same direction, all except one. That aircraft had radio failure but, instead of sitting over the top and waiting until all the other aircraft landed, he decided to immediately join upwind to land in the opposite direction. Fortunately, someone saw what was about to happen and we scattered out of his way.

I also read of a student pilot getting lost on his first cross country flight. Apparently he flew about hoping to recognise some feature which would determine his position. I expect panic finally took over, because the aircraft crashed when it ran out of fuel.

One of my pilot course members who went on to become a senior CFI in the RAAF has flown with me of late and has told me he is appalled at what many pilots are doing (or not doing). He often comments "there goes another pilot who doesn't know what he doesn't know".

FIXING THE PROBLEM

I appreciate the fact many recreational pilots have limited finances and time. Therefore, adding items to the syllabus could dissuade them from entering aviation - not what we want to happen. So the only option is to improve the instruction they receive. In other words are the instructors good enough?

INSTRUCTORS AND STUDENT PILOTS

I have heard pilots with very few hours talking about becoming an instructor. It is not sensible. They don't even know what they don't know. Instructors should be required to amass at least 1,000 hours and five years flying experience before ever being considered for an instructor rating.

What is also needed is for instructors to increase their teaching of airmanship and increase the amount of knowledge they pass on to the student during flights and debriefings.

CURRENT PILOTS

But what about improving the skills of pilots already in the air?

It is up to aero clubs to attract pilots to join and attend educational functions, be they flying competitions, educational evenings or fly-aways. Pilots must be encouraged to sit in the crew room and listen to older pilots telling tales - they will learn something, even if is only not to embellish a story.

RA-Aus pilots should be encouraged to read the text books required for a GA Private Pilot's Licence. It is much more detailed than that required for a Pilot Certificate. There is a lot published on the RA-Aus website, but unfortunately many pilots do not have the incentive to read these wise words.

REGULATIONS

Obviously, there will be many pilots who fall through the net, such as farmers or those who operate their own aircraft from their own strips. If they cannot be attracted voluntarily perhaps regulations need to be changed so that without a certain number of hours of study a year, they will not be able to pass their BFR.

And on the subject of BFR, why shouldn't pilots be required to fly in an aerobatic aircraft and enjoy the experience of non-straight and level flight as part of their first BFR. Also, they should have to experience flying under IFR conditions in turbulent weather. Before you raise the argument that such action might encourage illegal IFR flight, I can assure you flying in turbulent cloud will frighten the pants off any inexperienced pilot, sufficient to demonstrate that flying in cloud is not the place to be. If a pilot later faces a similar situation, the early experience might persuade them that pressing on is not an option.

PILOTS

I was once told that the day you go flying and don't learn something is the day you should hang up your headset. Pilots must be encouraged to ask questions and better their own education. It is vital air safety be improved for the good of all. A pilot's knowledge of the machinery they use and the environment in which they fly must be brought to the forefront.

It is up to all pilots to help others learn to be safe. If pilots just want to learn to fly an aircraft so they can enjoy the experience and toddle off somewhere exciting, then expect a disaster. Flying is much more involved than the simple mechanics of piloting a machine. Flying requires dedication to improve skills. Not only will you enjoy flying in a safer environment, it may save your life.

RA-AUS

I see *Sport Pilot* has a section called 'Pilot Notes'. The idea is sound but if we are to get the full benefit from other pilot's misfortunes, I suggest the section be renamed 'Incidents and Accidents', surely a more accurate reflection of the content.

Also, if applicable, comments need to be added to each item to explain what the pilot should have done. Hopefully, readers who experience similar situations will take the suggested actions early enough so their own potential incident or accident does not happen.

Another area which could reap dividends is for RA-Aus to publish advanced discussion guides suitable for instructional periods at aero clubs, fly-ins or gatherings of pilots. Because these meetings may include GA members, the discussion guides should be aimed at these aviators as well.

Care has to be taken that such discussion guides don't end up teaching pilots how to suck eggs. I would imagine some suitable discussion guides are already available on the internet and would only require minor modification to suit our needs. Volunteers would be required to construct the guides.

Perhaps with all this, pilots will be trained as well as they could or should be.

"There goes another pilot who doesn't know what he doesn't know

>> Sabre

Why mechanics make mistakes

by Mike Busch

Reprinted with permission from AVWeb

DURING the century since the Wright Brothers first flew, the predominant perpetrator in aircraft accidents has shifted dramatically from machine to human. Today, human error is responsible for 90 percent of aircraft accidents and incidents.

It's not that people have become more careless, forgetful, inattentive or reckless. It's that aircraft and aircraft components have become much more reliable. As component failures become fewer and fewer, human failures represent an ever-increasing percentage. Most of the efforts of the aviation research community have focused on errors committed by pilots.

However, there have been a significant number of serious, even fatal, accidents caused primarily by maintenance errors. While there has been increased focus on maintenance errors by the airlines, not nearly enough attention has been given to general and recreational aviation.

KINDS OF MAINTENANCE ERRORS

Less-than-adequate maintenance can be divided into two broad classes:

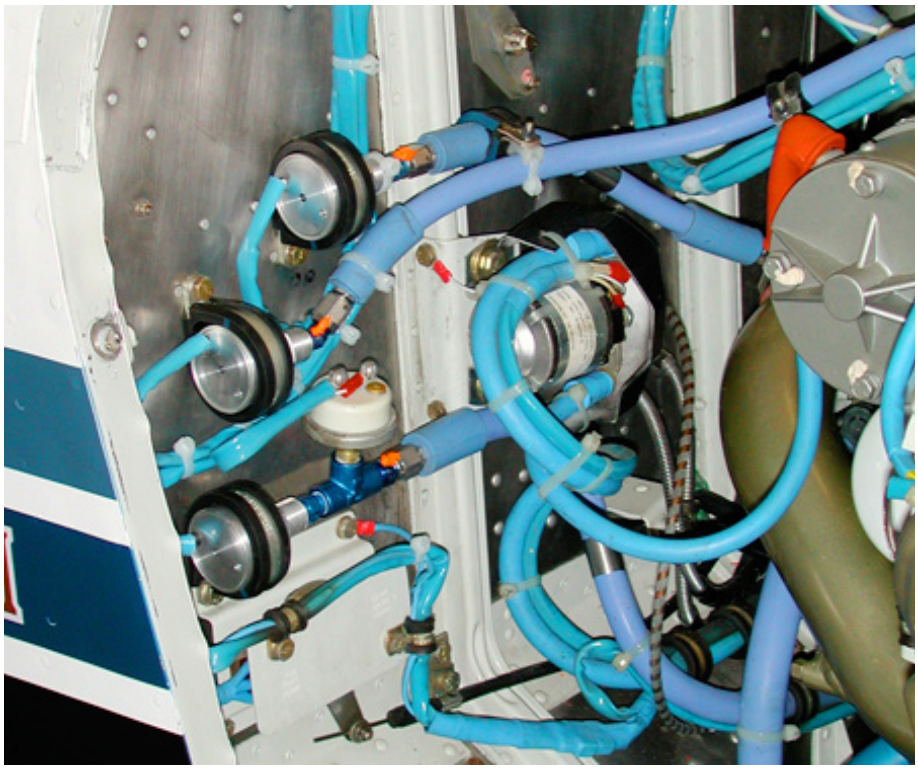
Introduction of a problem not there before the maintenance began; and

Failure to detect a pre-existing problem during maintenance inspection.

Errors of omission seem to be the most prevalent kind of maintenance errors. An analysis of 122 maintenance errors detected by a major airline over a three-year period revealed the following breakdown:

FIGURE 1 Most maintenance errors are errors of omission.

Omissions: 56 per cent
Incorrect installation: 30 per cent
Wrong parts installed: 8 per cent
Other errors: 6 per cent



>> Component failures have become fewer

So most maintenance errors are errors of omission.

When the errors attributed to omissions were further examined, the breakdown was:

Fasteners left undone or incomplete: 22 per cent
Items left locked or pins not removed: 13 per cent
Filter/breather caps loose or missing: 11 per cent
Items left loose or disconnected: 10 per cent
Spacers, washers, etc., missing: 10 per cent
Tools, spare fasteners, etc., not removed: 10 percent
Lack of lubrication: 7 per cent
Access panels left off: 3 per cent
Miscellaneous: 11 per cent.

THE REASSEMBLY PROBLEM

Clearly, most maintenance errors occur not when taking something apart, but when putting that something back together. There's a good reason for this. Consider a bolt (figure 2 below) onto which eight nuts have been assembled, each one labelled with a unique letter A through H.

Assume that the mechanic's task is to disassemble the nuts from the bolt, clean them and then reassemble them in the original order. There is really only one way to take this assembly apart,

FIGURE 2 There is only one way to take this assembly apart, but more than 40,000 ways to put it back together.

but there are 40,320 different ways in which it could be put back together - and 40,319 of them are wrong! This simplistic example illustrates the fact the task of disassembly usually constrains the mechanic to one particular sequence, with each succeeding step prompted by the last. The mechanic doesn't require much guidance, because the disassembly procedure is usually obvious. In contrast, correct reassembly usually requires knowledge - either in the mechanic's memory or in written form. Human memory being as imperfect as it is, means reassembly based on memory is error-prone. Reassembly based on written guidance (such as a checklist or service-manual instructions) is far more reliable, but people doing a hands-on job tend to be reluctant to consult written instructions. Reassembly-by-memory is probably adequate for tasks the mechanic does every day. Most maintenance tasks aren't like this, however, and we all know how easily we can forget the details of a task af-

ter even a short period of time. To make matters worse, a wrongly-assembled component is not always obvious on later inspection. The absence of washers, bushings, fasteners, seals, O-rings, caps, lubrication, etc., is often concealed once the component has been reassembled. Thus, reassembly errors often create the opportunity for double jeopardy: a high probability of forgetting something important during reassembly and a low probability of detecting the error once the job is completed.

SLIPS, MISTAKES AND VIOLATIONS

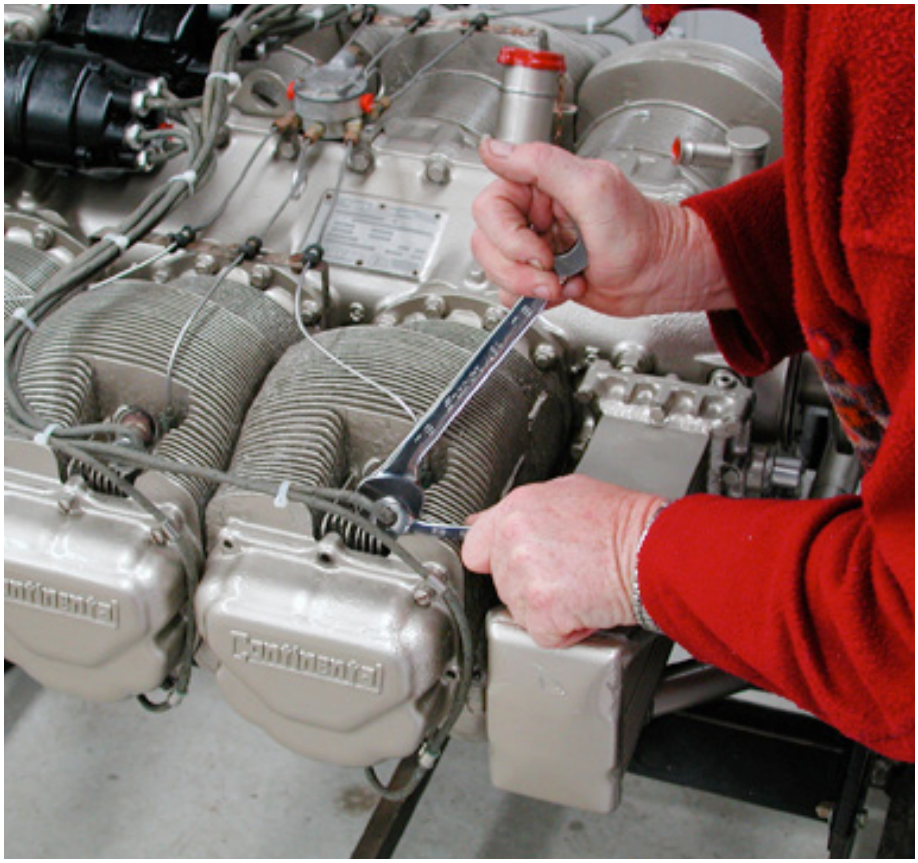
Failures by a mechanic to perform a task as planned are commonly termed slips, lapses, trips or fumbles. A slip occurs when the mechanic is trying to do the right thing, but screws it up somehow. Slips can be caused by:
Omitting some necessary action;
Performing some necessary action in a clumsy fashion;
Performing some unwanted action; and
Carrying out the right actions in the wrong order.

Such slips most often occur when doing tasks by memory - often well-practiced tasks done frequently in an automatic fashion. Mistakes are higher-level failures caused by an error in the plan itself. These are usually caused by lack of knowledge and occur most commonly when performing tasks not done often. Forgetting to torque a cylinder hold-down nut is a slip; torqueing it to the wrong value is a mistake.

Violations are deviations from standard practices, rules, regulations or standards. While slips and mistakes are unintentional, violations are usually deliberate. They often involve cutting corners and often become part of a mechanic's habit pattern. Recently I wrote about an incident in which the pilot of a Cessna 340A launched into IMC on the first flight after maintenance, only to discover that his airspeed indicator, altimeter and VSI stopped working as the aircraft climbed through 3,000ft. The cause of the problem turned out to be a mechanic's failure to reconnect a static line disconnected during maintenance to facilitate access. The mechanic's failure to reconnect the line was an inadvertent slip - he forgot. On the other hand, the mechanic's failure to perform a static-system leak check (required any time the static system is opened) was a deliberate violation. Because of the violation, the slip went undetected and jeopardised the flight.

DISTRACTIONS

Distractions play a big part in many errors of omission. A common scenario is that a mechanic installs some nuts or bolts finger-tight, then gets a phone call or goes on lunch break and forgets to finish the job by torqueing the fasteners. I have personally seen some of the best, most experienced mechanics I know fall victim to such seemingly rookie mistakes. I know of several fatal accidents and countless less-serious incidents caused by such omissions. Just as pilots need a 'sterile cockpit' during high-workload phases of flight, mechanics need a distraction-free workplace when performing safety-critical maintenance tasks. Unfortunately, the typical shop is a distraction-rich environment. Phone calls come in. Customers drop by unexpectedly. Couriers deliver anxiously-awaited parts. The shop's principal maintenance inspector pays a surprise visit. The roach coach arrives with lunch. This is less of a problem in the big shops, but even they have issues. Shift changes cause lots of problems, when the first-shift technician assumes the second-shift technician will handle something, but the second-shift guy fails to do it because he assumes the first-shift guy handled it.



>> The typical shop is a distraction-rich environment

QUALITY ASSURANCE

I've visited a half-dozen different GA aircraft and engine factories to watch how they build our flying machines. One of the fundamental work rules at these plants is that there must always be at least two sets of eyes on every step of the process: the technician who performs the work and an inspector who verifies the work has been done properly. Often, there are three sets of eyes: two technicians who work as a team and check one another's work and an inspector who re-checks the work. But in smaller shops most maintenance is checked by just one set of eyes belonging to the mechanic who did the work. Fewer sets of eyes inevitably mean more slips, mistakes, violations and discrepancies escape detection.

THE OWNER AS FINAL INSPECTOR

Aircraft owners and pilots need to understand maintenance errors create a significant hazard and act accordingly. The most likely time for an aircraft to have a mechanical problem is on the first flight after maintenance. Prudence demands a post-maintenance test flight every time the aircraft comes out of the shop. The test flight should be done in VMC, without passengers and in a place where the pilot can easily put the aeroplane back on the ground if something isn't right. Prior to the test flight, the owner or pilot should conduct an extraordinarily thorough pre-flight. Make sure all inspection plates and fairings are installed and secure, all cowling fasteners are tight and all fuel and oil caps installed. Check all flight controls and trim systems are free throughout their full range of motion and operating in the correct direction. Check all instruments and avionics systems are functioning properly. Perform a ground test of the autopilot. Run up the engine thoroughly, then shut down and check for leaks. Be sure you don't smell fuel or anything burning. In short, be thoroughly sceptical any time an aircraft comes out of maintenance. Your pre-flight and test flight are the last line of defence against maintenance errors.

>> In big shops an inspector re-checks the work

STEP DRILL BITS by Norm Sanders

Where have you been all my life?

THE internet is full of horror stories about the problems of fitting canopies without causing cracks. One Sonex owner stated that fitting the canopy was the hardest part of building the entire airplane.

The difficulty lies in cutting the plastic to size and drilling mounting holes without causing stress risers which can lead to cracking. Cutting is the less problematic. Some people use bandsaws, some use angle grinders, others use oscillating multi-tools. The resulting edge can then be sanded to erase any roughness.

Holes are another thing entirely. Using an ordinary drill bit is asking for disaster. It will bite too fast and the plastic has a tendency to grab onto the flutes and then climb up the bit. One solution is to blunt the bit by drilling into a lump of concrete. Another is to reverse the rake on the cutting edge of the bit so it is less effective. Any of these solutions is still likely to result in a hole flanked by stress risers.

Enter the step drill bit or Unibit. It is a conical bit with a stairstep profile. Instead of having flutes spiralling around the bit, the design has cutting edges on opposing sides. The bit carves into plastic smoothly, leaving clean holes.

The same bit can drill a wide range of hole sizes, from 4mm to 32mm. It's a tool so handy that step drill bits were included as standard equipment on Space Shuttle missions.

The step drill bit uses a series of ledges between drill diameters. After drilling the desired diameter hole, the bit hits a ledge and stops momentarily. Slight pressure at this point will chamfer the edge of the hole (or take the burrs off a previously drilled hole.) Heavier pressure pushes the bit to the next diameter.

In addition to drilling plastic, step drill bits are good for thin sheet metal and general work with plywood, particle board and laminates.

Probably the best (and cheapest) place to get step drill bits is on eBay where a set of three titanium-coated bits (4-12, 4-20, 4-32 mm) costs $12.95 plus freight (With nifty red case included).

>> A packet of Unibits

As far as canopies go, I would limit the number of holes, whichever bit is used. I have recently received a new Sonex canopy from the U.S to replace the old, cracked one. I plan to have only a few fastenings, mostly for positioning. The canopy will be glued to the frame with Sikaflex 227, the stuff they use for car windshields.

Step drill bits have been around for a long time. They were originally marketed as Unibits. The inventor was a brilliant guy by the name of Harry C. Oakes who patented the idea in 1973. I regret it took so long for me to find them, but better late than never.

PILOT NOTES

For a listing of all 2014 accident and incident summaries see www.raa.asn/safety/accident-incident-summaries-2014

Piper L4 H Cub

Pilot experience: Instructional flight

The student, who had not flown for several weeks, was about to undertake circuit training. Shortly after the take-off roll commenced the aircraft veered to the left and the student overcorrected. The instructor attempted to take control but was met with resistance. He called "taking over" but the right wing contacted the ground and the aircraft flipped onto its back. Both occupants exited without injury but the aircraft was destroyed.

Jabiru 230D

Conditions: Light wind and turbulence

As the pilot landed the aircraft, it touched down heavily and bounced so he requested an instructor, who was a passenger in the aircraft, to make a go round. The subsequent landing was good but the brakes were ineffective. As the strip was short, there was no other option than to ground loop the aircraft before it impacted trees and a fence. The occupants exited the aircraft without injury but both brake callipers were damaged and a brake line had fractured. The right hand tyre had also rolled off the rim and damaged the wheel spat.

Edra Super Petrel

Engine: Rotax 912 ULS, 468hrs ttis

The aircraft had just taken off and was climbing through approximately 300ft when the engine began to run roughly and lost power. The pilot informed Flight Service that he was returning to the airfield under reduced power and made an uneventful landing on the departure runway. Investigation revealed there was a small amount of water and sediment in the right hand carburettor.

Bristell LSA

Conditions: Strong winds, moderate turbulence.
Pilot experience: 5.5 hrs on type

The aircraft was cruising at 5,400ft when it suddenly yawed violently and rolled inverted. The pilot hit his head on the canopy and then applied opposite rudder and idle power to recover from the resulting dive as the airspeed had increased to near Vne. He regained control at an altitude of approximately 300ft AGL and flew a reciprocal course to an airfield where an uneventful landing was carried out. Given the strong winds and the fact the aircraft was flying in the lee of a mountain range, it was assumed the aircraft had entered rotor turbulence often associated with these meteorological conditions.

Searey

Pilot experience: 613hrs, 37 on type

While practicing a water landing in the amphibious aircraft, the pilot forgot to retract the undercarriage. The aircraft touched down on the water and sustained major damage to the fibreglass hull. The pilot suffered minor grazing and bruises from his seat belt.

Jabiru SP470

Pilot experience: 59hrs, 28 on type
Conditions: Light wind and turbulence

The aircraft had touched down and travelled about 30ft on a grass strip. As the brakes were applied, the nose wheel collapsed and the aircraft flipped inverted, resulting in damage to the nose gear, cowl, propeller, left wing strut and a rear window. The pilot was not injured.

"The right wing was lifted by the wind and as the pilot applied braking, the aircraft tipped onto its nose

Jabiru J230

Engine: Jabiru 3300, 509hrs ttis

While the aircraft was on cruise, the engine began to run roughly and lose power. A precautionary landing was carried out at a nearby airfield using reduced power. After the landing the engine ran unevenly for a short time and then stopped. Investigation revealed the No. 1 exhaust valve retainer had failed.

Avid Flyer

Engine: Subaru EA 81, 0.5hrs ttis

On the second test flight of a newly completed aircraft, the engine failed at approximately 1,000ft AGL. A restart was attempted as the aircraft approached the strip on the downwind leg but after running at low revs the engine failed again. During the subsequent landing the aircraft sustained damage to its undercarriage and fuselage.
The fuel flow was found to be severely restricted by a fuel flow transducer which had been fitted after the flow rate had been measured during assembly of the aircraft.

Trike Flash powered parachute

Pilot experience: 180hrs all on type
Conditions: Light and variable winds

While attempting an engine off landing, the pilot misjudged the wind direction and sink rate of the aircraft. It impacted the awning on a motor vehicle. A person sitting under the awning was struck by parts of its structure and required transportation to hospital for observation. The PIC of the aircraft was not injured and the aircraft sustained damage to the propeller cage and one axle.

Jabiru J160C

Conditions: Moderate wind and turbulence
Pilot experience: 353hrs on type

The aircraft was being taxied towards a hangar across an area of grass with a very low diagonal hump running across its path. The right wing was lifted by the wind and as the pilot applied braking, the aircraft tipped onto its nose. With the engine at idle and the left wingtip on the ground, the propeller struck the ground with further damage to the nose gear and wingtip.

Lightwing GR 912

The pilot was using fuel from the right hand tank as part of the normal fuel management procedure for this aircraft. He set the aircraft up in a steep nose down attitude to descend below a control zone step and after a short while the engine stopped. The engine restarted after trouble checks which included selection of both fuel tanks. The pilot noted that during the 600 hours he'd flown in the aircraft he had never unported a fuel tank outlet, but now knows it is possible when the fuel level is low.

DESIGN NOTES

DAVE DANIEL

All in a flap

THERE'S a lot to be said for landing at the lowest possible speed, especially if your landing happens to be an unscheduled arrival in a paddock, because your engine went on strike. In a landing you are essentially disposing of unwanted kinetic energy which, as your high school physics will tell you, is proportional to speed squared - so a landing at 45kts will have half the energy of a landing at 64kts. This is critical if you are unfortunate enough to have a crash-landing. Slower is definitively going to be better, which is why ultralights are limited to a maximum stall speed of 45kts.

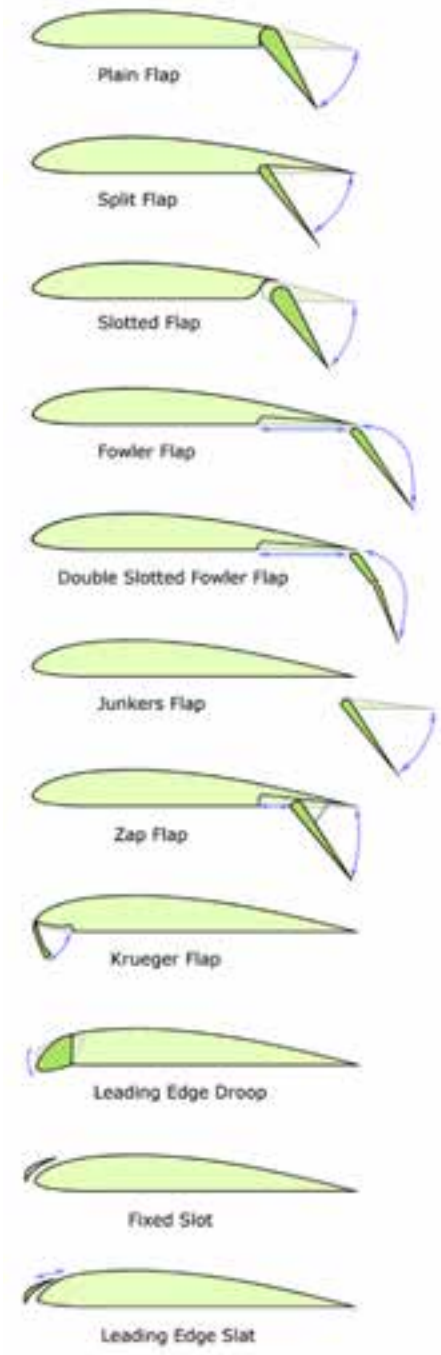
Of course the prerequisite for a low landing speed is a low stalling speed and as you will know from my previous articles, a low stall speed requires either a large wing area or an aerofoil capable of generating lots of lift, (i.e. one with a large CL_{max}). But there's no free lunch and big wings and lots of camber mean extra drag and a reduction in cruise speed. To get the best of both worlds we need wings which can be reconfigured and some form of high lift device will be required.

High lift devices come in many different flavours: flaps, slots, slats etc. But they all achieve their purpose through one or more of the following mechanisms: by increasing wing area, by modifying the camber of the wing or by increasing the stalling angle-of-attack.

Simply increasing the wing area is the obvious solution, but it isn't the most weight efficient way of generating additional lift, especially when compared to the alternative of increasing the aerofoil camber. A plain flap of 30% chord deflected to 45° will achieve an increase in local CL_{max} equivalent to locally extending the wing chord by 50%. Both techniques would require actuating hardware but adding wing area also requires additional wing structure and space to stow it when retracted. Increasing the wing camber on the other hand, simply requires a means of pivoting part of the existing wing surface downwards.

Increasing the camber to generate additional lift does have knock-on effects: Firstly there is an increase in drag, especially at larger flap deflections. This is not necessarily a bad thing however because it degrades glide performance, allowing a steeper approach angle for better obstacle clearance. Secondly, adding camber to the rear of the wing increases the nose down pitching moment. This is significant because countering a large increase in pitching moment at low airspeed can be critical to the sizing of the horizontal tail, (and if large tail forces are required, also the structure of the rear fuselage). Trimming out large pitching moments will also increase the trim drag which, combined with the other drag increases, could get you into trouble if there isn't enough excess power available and you find yourself on the back side of the power curve. Finally, extending flaps changes the effective angle of incidence of the wing relative to the fuselage, permitting the approach and landing to be flown with the fuselage in a nose lower attitude. In some aircraft this can significantly improve the pilot's view of the runway.

FIGURE 1 An assortment of the more common high lift devices

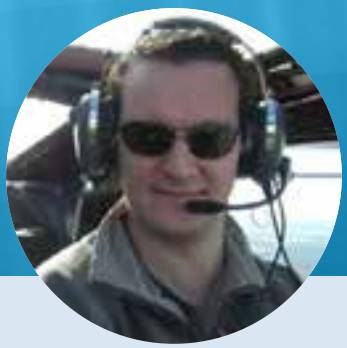


FLAP TYPES

First up is the Plain Flap – just rotating the rear portion of the wing downwards. It is a simple solution but its effectiveness is limited by the tendency for the airflow to separate at the sharp change in direction created on the upper wing surface when the flaps are deflected. Split Flaps avoid this problem by leaving the upper surface unaltered and only deflecting the lower surface, giving slightly better lift performance, but at the cost of a larger pitching moment and increased drag. Zap Flaps are similar in concept to Split Flaps, but the extension mechanism also moves the flap rearwards as it rotates, giving an increase in wing area along with the increase in camber.

In more recent designs, both Plain and Split Flaps have fallen out of favour, leaving Slotted Flaps as the most popular choice. The benefit of a slot is that air is accelerated through it much like a nozzle, which encourages the airflow to stay attached, delaying the stall and improving performance. Junkers Flaps are similar in principle to Slotted Flaps but do not retract, being simply aligned with the airflow when retracted to minimise drag. Placing the pivot point for a Slotted Flap below the wing causes flap extension to not only alter the camber but add to the wing area as well, providing additional benefit. Large transport aircraft often take this approach a step further by having multiple slotted Fowler Flaps. These extend backwards adding wing area and camber, allowing an even greater increase in lift at the expense of increased pitching moments and greater complexity.

In smaller aircraft the function of flap and



Both plain and split flaps have fallen out of favour, leaving slotted flaps as the most popular choice

aileron is sometimes combined into a single control surface on each wing called a 'flapperon'. Flapperons operate independently for roll control but can also be drooped together to act as flaps. This approach simplifies the construction of the wing and permits a larger flap and aileron area, but requires a mechanical mixer to combine the flap and aileron controls which complicates the control system.

Trailing edge devices are not the only high lift option. Leading edge slots, slats and droops are still common, especially if STOL performance is required. Slats extend from the leading edge, opening a slot which guides and accelerates the air flowing through it and allow the wing to reach a higher angle-of-attack before stalling. Slots are identical in function to slats but are permanently fixed; relying only on their geometry to limit the flow of air through the slot at lower angles of attack and thus avoid excessive drag at higher speeds.

While not common on ultralights, commercial jets are frequently fitted with Krueger Flaps or leading edge droops. Both increase the camber of the wing and Krueger Flaps also provide additional wing area. Because they affect the leading edge of the wing, they are often combined with Slotted Flaps to assist in balancing the large pitching moments created when flaps are extended.

For those keen on innovation a fair amount of research has gone into investigating active boundary layer control – blowing or sucking air through vents on the top surface of the wing to energise the airflow or suck the sluggish part of the boundary layer into the wing. But I'm really not expecting to see it appear on the average ultralight any time soon!

DESIGN CONSIDERATIONS

Flaps need to be large enough to do their job effectively at low speeds, but as a result they also have the potential to generate huge pitching moments and structural loads if deployed at higher speeds. The weight penalty involved in designing an aircraft's structure and flap system capable of withstanding deployment at high speed is prohibitive, so rather than beef up the structure, a speed limit is set on flap deployment.

FIGURE 2 The current incarnation of my Project-Ex design has Slotted Flaps which should give an estimated 42kt stall speed when loaded to 600kg

An important secondary consideration for any flap system is that it must always operate both flaps symmetrically, even following a component failure. Asymmetric flap deployment can generate huge rolling moments greater than the ailerons can counter, practically guaranteeing a crash.

As a final thought, installing flaps requires additional structure to distribute the generated loads - there is the weight of actuating mechanisms, motors etc. and the additional complexity of the control and indication system - all of which add potential points of failure. Put simply, for a slow, lightweight and high drag aircraft the best flap design is probably no flaps at all.

NEXT MONTH
Landing Gear

FLIGHT INSTRUCTOR'S FORUM

Facilitated by the aviation guru
Professor Avius

Be Appy with That!

MOST instructors will agree - one of the most challenging aspects of training pilots is teaching the landing.

It doesn't matter what type or size of aircraft you fly. Landing is all about airspeed/energy management and maintaining a stabilised approach.

SOME FACTS

Vref is the airspeed to achieve on short final. It is the equivalent of Vso x 1.3.

Vso is the stall speed in the landing configuration, with undercarriage and flap down and power off.

Note - If gusty or cross wind conditions - add ½ the gust speed in knots.

Meaning the approach speed provides a 30% safety margin over the stall speed, in the landing configuration. Importantly, this doesn't change whether you are conducting a normal landing, a short field landing or a glide approach.

REMEMBER DAVID JACOBSON?

Retired Qantas captain, David has spent the past 30 years advocating and lecturing on the application of his effective, practical and now universally accepted landing technique.

He and his team have spent the past two years developing a very polished and professionally presented Jacobson Flare app for iPad. The app is well designed and suitable for use by both instructor and student, and explores the where, when and how involved in landing an aircraft. It has two distinct interpretations: in Portrait mode as an e-book and in Landscape mode as a comprehensive illustrated presentation.

As well as the safety aspects, the app sets out to demystify the imprecise aspects of how to land an aeroplane which have remained unchanged since World War 1.

Graphically enhanced HD videos of various airplane types demonstrate the same consistent and quantified technique of landing and flare, over a diverse range of locations. The Jacobson Flare app offers a solution to what can be a serious, long term and extremely frustrating problem faced by both instructors and students alike.

I found the app logical and easy to use. Equivalent to a 350 page text book, it is interactive and comprehensive.

The app is priced reasonably for students, making it accessible to all. Learning the Jacobson Flare will save you time in the circuit, and the app will save you money in the air. You've got to be appy with that!

FOR MORE INFORMATION

https://itunes.apple.com/au/app/the-jacobson-flare/id881263940?mt=8
website: www.jacobsonflare.com

NOTE TO ALL INSTRUCTORS

The Inaugural RA-Aus CFI/Senior Instructor Conference will be at Dubbo on November 11-13.

This will be an excellent opportunity to improve safety standards and performance throughout the industry. It is a great initiative from the RA–Aus leadership. The Prof strongly recommends you plan to attend. Everyone else will be there. For more information visit the website.

>> The classic Opal

Help the Opal complete its mission

WILL one of the classic Australian ultralight designs take to the air once more? Will it complete its mission? Dean Winton's answer to both these questions is a firm yes. Dean is trying to resurrect his brother, Scott's, Opal design (*Sport Pilot* June 2014).

Dean now has a small group around him which wants to see the Opal fly again. Not only are there plans afoot to restore the Opal, but it will be further developed. This plane is not bound for a museum, at least not yet. The eventual goal is a transcontinental one, non-stop east to west. The plane's original mission is not yet complete. There is one more record left to break.

Your support is sought. Don Ramsay reports the Opal restoration fund has only $165 in it so far, donated by four RA-Aus members.

So far not so good. Neither has a low cost work space been located in the Southern Newcastle area. If you know of one, please get in touch with *Sport Pilot*.

Remember no donation is too small. The Westpac account details are:

BSB: 732 501 Acc: 609 627 Remember to tag your transfer with your name and membership number.

LEARNING TO FLY

ANTHONY SIBRARY

Leaving home

HAVING completed my first solo, I felt as though my training was beginning all over again. My Instructor, John, told me we would fly to Wedderburn for some touch and goes and then out to the coast. This would be my first time landing at a strip other than the Oaks and, to make things really interesting, we would have a small crosswind. John had previously taken me through crosswind theory and I had completed a number of solo hours practising these techniques at YOAS.

In one of my earlier columns, I mentioned that the location of the Oaks means there is often a crosswind. Today was no different, with the wind out of the southwest. I completed the usual checks and we departed off 18L for our short flight to YWBN. John explained the correct heading I should maintain so we would not fly over the Appin township, as per the instructions in the ERSA.

On arrival, I reduced throttle and made my radio call as we joined crosswind for runway 17. In one of my earlier lessons, John had shown me the landmarks at the Oaks pilots use to help them fly an accurate circuit there. In doing so he cautioned me that, although this was great for the Oaks, I needed to develop my technique so I would make turns at the correct point and height without needing to rely on any landmarks.

Now here I was at YWBN in the circuit and feeling happy I was doing just as my Instructor wanted. Everything in this circuit looked so very different, especially the billiard table smooth stretch of tarmac I was moments away from landing on. Not to mention all those magnificent gum trees surrounding the airstrip. It reminded me of that saying in billiards...'the centre of the table is your friend'. An unknown strip, a crosswind and trees? What's the worst that can happen?

The crosswind was from the right, so I had the Jabiru banked slightly to the right and my airspeed a little higher than normal on approach. As ever, it was stick and rudder all the way to the runway. I'd never landed on a bitumen strip and John told me that, once on the ground, the Jabiru would be more sensitive to rudder compared to the grass strip. Boy, he was not kidding. The difference was incredible.

After two successful touch and goes we headed over to the coast just north of Wollongong. Even though there were no other aircraft in the immediate area, I monitored the radio and, as ever, spent most of my time looking outside the aircraft. Using Appin Road and the Appin Colliery as a guide, John showed me how to reference these features to stay outside of CTA. We made the turn over the lookout at Bulli and headed back to the Oaks where I spent the remainder of the lesson in the circuit.

I really enjoyed this flight. Getting out of the training area, using different radio calls and flying to a new airfield was great fun.

>> Away from home

>> Tiger country ahead

Almost as much fun as completing the BAK exam when I got back to YOAS. I am pleased to report I got another strong pass mark (94% if you must know). Now it is just the HPL exam to go and my theory component will be complete. So I better hit the books again. Of course I will be enjoying some down time in between. See you in the pilot's lounge for cocktails and debriefing.

HOMEBUILDER

Engine power

DAVE EDMUNDS

WHEN I learned to fly, I was told to climb at full power and, on reaching cruise altitude, reduce power to around 75%, set the mixture and off I would go.

But this is not what actually happened. Power from an aircraft engine with a fixed-pitch propeller is related to RPM, but only at a particular aircraft speed. The power curves produced by manufacturers are usually static power curves, i.e. determined when the engine is stationary.

Determining power in flight is not straightforward. The best way to do this would be to measure crankshaft torque and RPM. In metric units, power is torque times rotational speed in radians per seconds. There are 2pi radians per 360 degrees.

For example, 2,850RPM is 47.5RPS, which is 47.5 X 2pi = 298 radians per second.

If the crankshaft torque is 200 newton metres (Nm), then the power of the engine is 298 X 200 = 59.6 kilowatts. The conversion from kW to horsepower is 0.746, so this is 44.76/0.746 = 60HP. (Check the Jabiru power -

http://www.jabiru.net.au/Manuals/Engine/JEM2204-10_IM_unsigned.pdf)

The calculation is the same in imperial units, except there are a whole lot of fudge factors because the units don't mesh.

Power would be nice to know, except I cannot find a nice, cheap light torque transducer for sale on the internet. Ideally you would fit one between the propeller and crankshaft. Good luck with that.

The other, and far less accurate, approach is to work out your power from the fuel you use. This requires quite a few assumptions, but will get you in the ballpark.

My Jabiru in cruise at 4,500ft, at 2,850RPM, fitted with a Rotec throttle body injector, uses 13.2 litres per hour of 100LL fuel. To get this consumption I have adjusted the mixture so I have very conservative CHT and EGT and the engine is running well rich of peak (ROP). That is, it is exhausting some unburnt fuel which, through evaporation, helps to cool the engine. I can run the engine much leaner than this, at less than 12L/hr, but I worry about heat. It will not run lean of peak (LOP), presumably due to some mixture distribution issue to the various cylinders.

Now, 100LL when burnt releases 32 megajoules (MJ) of energy per litre, according to the internet, (so it must be right). So my engine is using 32 X 12 MJ per hour, or 32 X 12/3600 MJ per second = 0.107MJ per second.

But at best my engine is only 20% efficient and I think this is optimistic. So the energy actually transferred to the propeller per second is 0.107 X 0.2 MJ = 0.02MJ or 20kJ. By the beauty of the metric system this means the power output is just 20KW or 27Hp.

The power curve published by Jabiru shows around 59kW at 2,850RPM, but this is measured statically on a dynamometer.

So, when I reduce my power to cruise, I am cutting it way less than 75%, to about 30% even taking into account some of the assumptions in the calculations above.

After I started preparing this article I experimented a bit with my power settings and was surprised at just how far I throttled back to get to cruise power, which provides some intuitive support for my calculations.

At this point I imagine some of you are sitting there with glazed eyes wondering where on earth this is going.

Follow through the reasoning.

Consider a 540kg aircraft climbing at 700 feet/minute, or 213m/minute. The aircraft is increasing its potential energy by 540 X 10 X 213 J/minute = 19kJ per second, which equates to 19kW of power in addition to the power required to overcome drag.

The drag is considerably greater than in cruise at the same speed, but the speed in climb is also considerably less than in cruise and drag increases by the square of the speed, so for the sake of this argument, lets assume that these factors cancel out. This means the power to climb is, on this approximation, the cruise power added to the power required to increase the potential energy of the aircraft, that is, 19 + 20, or 39kW, or 52 horsepower. Note that this is considerably less than the power you may have thought you were getting, i.e. the full power of the engine.

It would be possible to again calculate the power required to climb based on fuel consumption, but most aircraft engines are designed to run particularly rich when at high power settings in climb, because heat dissipation is a much larger problem than in cruise. However, the climb calculation above seems to agree roughly with what I see in terms of fuel consumption in climb.

Petrol engines have to be carefully matched to their transmission systems to ensure efficiency, but this is far less the case with electric motors and this is where the argument is going.

NEXT MONTH **Installing electric motors in light aircraft**

Wings & wheels open day

by Kevin Wilson President, Grafton Aero Club

>> A busy flight line

AROUND 1,000 people attended the annual Wing and Wheels Open Day at Grafton in August.

The club had secured a small amount of sponsorship from Clarence Valley Council which enabled us to promote it locally.

The weather was fantastic after days of really wild weather and 90mm of rain.

The Wings and Wheels is only a four hour event and we began setting up just after 8am for a 10am start. But by 8:30, local people started arriving and by 9am aircraft started to arrive as well. I thought there weren't that many here and wondered if our planning had been for nothing. But just then a convoy of classic, touring and sports cars stretching down Vere Street as far as the eye could see, arrived and four aeroplanes called in the circuit.

Soon the clubhouse was full, every available seat taken and people were enjoying their morning tea, cakes and savouries.

We had aircraft from around the local area as well as from Kilcoy, the Gold Coast, Lismore, Coffs Harbour and Port Macquarie.

Club member, Andy Ski, put on an aerobatic display in his Skybolt at lunchtime and aircraft kept coming and going.

JACARANDA MUSTER

The next big event for the Grafton Aero Club will be the Jacaranda Muster on the weekend of October 25 and 26.

We hope to see everyone there.

> *The clubhouse was full, every available seat taken*

>> Fun for the whole family

>> Classic cars

>> All parking was packed

>> A cloudless day after all the rain

>> The public came in numbers

>> Every available seat was taken

members' market

2671 JABIRU SP 500/6 19-3717

Well maintained hangared. 449.5 hrs. 123kts @19ltrs hr. Sweetapple cruise prop, custom extractors, 10 ply mains, 85ltr tank. STD gauges electric turn coordinator, volt meter, fuel flow meter. XCom VHF & headsets, + UHF & 2xGPS. Grim voltage regulator, Anderson jump start plug. Deliver anywhere. $48,000 . 08 9921 8790

3176 STORM 300 SPECIAL

Level 2 owned and maintained. 912S 100hp Rotax 780 hours. In flight adjust prop, KT79 transponder, 2X VHF radios Lightspeed ANR headsets, carb heat, AH (Vac) Garmin 196 GPS, Man pressure, ASI, ALT, CHT,plus heaps more $55,000 no GST for quick sale 0419348288 or pbugg@onthenet.com.au

3230 JABIRU FOR SALE

2008 model factory built, Sensinich prop, option 2 panel with additional 6 channels EGT and CHT digital display. Currently 720 hrs, impressive performer all AD's up to date... mechanically A1 couple of minor scratches here and there on the paint. $70000.00 ono, contact Chad for more info... Mob 0405339858

3268 EUROPA XS 19-7850

Europa XS. Reg. 19-7850, 170 Hrs. Jabiru 120 HP, 130 Knots cruise, long range tank, 20 Cu Ft baggage. Electric trim, A-Horizon. Reg custom built trailer. $50,000 Phone 0428 988 662

3309 THRUSTER TST

For Sale Thruster TST 582 rotax 2seat,good condition. wings have been removed to make space for new aircraft. Will consider all reasonable offers.For more information contact Anthony 0269938189 0429938189

3323 ZODIAC 601 XL-B

Zenith CH601 XLB, Rotax 912 S (100hp) MTOW 600kg, Upgraded to 650 Canopy, 105kts cruise, Dynon D100, Mode C Transponder, Garmin GPS 196, Wing lockers, A great aircraft for touring or just local flights. $50000 ONO Bendigo. Ph 0417 121 111

3408 JABIRU UL 2.2

TT 800hrs A & E as at 01.06.14, long wing with winglets & vortex generators. Excellent STOL performance. Cruise 95-100 knots @ 13 lph. Electric T & B, strobe, Garmin aera 500 GPS. Spare prop. Always hangared. Sth Aust. phone John 0400865868. $34,000.

3425 JABIRU

Very nice aircraft great endurance easy to fly lots of room. Working too much not enough time to fly. All work done by level two. $70000.00 call 0411 123 669 to find out how this can be yours.

3426 CHEETAH XLS

Cheetah XLS 24-7072. 98 hrs airframe and engine. Jabiru 2200 PP. Single owner always hangared. Easy to fly and maintaine. 90ltr tank, spacious cockpit. Digital inst with analogue backup. 75kts cruise. Based Bunbury, WA. Reduced to $28500 Must sell. Contact George on janspo@westnet.com.au or 0406226566

3428 JABIRU J230C

Great aircraft latest engine updates completed, too much work not enough time fly. New prop no accidents great touring aircraft, mains spats not shown in pic. $75k 0411 123 669 I'm also

interested in share holders the aircraft is located at northam wa min two share holders $25k.

3458 JABIRU SP UL 19-4319 FOR SALE

This aircraft is in immaculate condition with low hours and nil incidents,always kept in its hangar and fully serviced,would suit a new aircraft buyer. Paint and interior trim done professionally,asking $38,000. Selling due to retirement after many enjoyable years. Contact Len on 07 32035546 or email rily54@bigpond.com for more details.

3485 JABIRU J160C FACTORY BUILT

J160C factory built 2006. Option 2 Panel with Dynon EFIS, Garmin 296 GPS, Micro Radio & Transponder. Recent top end engine overhaul & upgrade. Always hangered, beautiful to fly. $40,500. Call Alan 0427 763 375 or more info at www.jabcor.com

3487 JABIRU SPT-6 TAILDRAGGGER

New Jabiru SPT-6 Taildragger, TT 30 hrs, New 3.3 engine, 85 litre tank, STD Jabiru dash,Gloss white ready for your decals. One of only four Jab 6cyl taildraggers. Goes like a rocket, Solo ROC 1800'/min, 125 kts @ 2700 RPM. YBNS airport. $49000. Phone Martin 0412 617110

3490 JABIRU 170C

August 2008 factory built. 435 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. $62000 Contact Kevin 0417131816

3498 JAB LSA, NEW ENGINE - BARGIN!

Total Hours: 2030 Engine Hours: 20 Price: $28,500 Factory built aircraft, new 2200 engine with only 20 hours on it, new control cables, new brakes (J120 units), new battery. Best value anywhere! Sweet to fly, cheap to operate. Always hangared, LAME maintained. Transponder mode C. ph 0434 082 023

3509 AIRBORNE 912 TOURER

AIRBORNE XT 912 TOURER 2007 MODEL 595 HRS STREAK 3 WING EXCELLENT CONDITION MICROAIR 760 VHF RADIO HELMETS WITH LYNX HEADSETS/INTERCOM PUNKINHEAD COVERS FULL SERVICE HISTORY RAA REG EXP MAY 2015 $34,000 kenj@jelfor.com.au 0412512457

3548 JABIRU J160

Hanger ed in Adels Grove 30 hours since motor installed, has 2 x Icom radio's 1 com system Garmin transponder Efis Altimeter Airspeed VSI (vertical speed idicator) Tacho Oil pressure Oil temp CHT (cylinder head temp) Volt Cargo door call Rod 0747485502 price dropped to sell $40,000. Great buy.

3552 JABIRU J230-D 24-5490

Factory built 2008, Airframe & engine 94hrs, Maintained every 25hrs, Nil accidents, Analogue instruments, Icom IC-200 radio, Garmin GTZ-320a transponder, Booster seats, Sensenich prop, Garmin 295 GPS. Always hangared & runs great. Contact Kevin: 02 4283 2671 or 0408 427 458 Email: kaybee@exemail.com.au $85,000

3554 THATCHER CX4

THATCHER CX4, - single place, completed may 2012. second of type to fly in Aus, 1915CC VW engine, starter, alt. magneto & secondary secondary ignition, sweetapple prop, tinted sliding canopy, disc brakes, strobe, strong undercarriage, full castoring tailwheel, great plane to fly, $26K call KEVIN 0448856983(Bris) (NO TEXTS PLEASE).

3579 CARBON CUB SS 180HP

Carbon Cub SS by Cubcrafters Inc, 200 hours, ready to fly away. 180 hp, optioned up, you will never get one at this price again. Tough, Safe, Powerful, and most off all FUN. Come and fly the most exciting cub ever, Tyabb Victoria. Call 0414 444 971 WWW. cubaircraftaustralia.com.au $230,000

3603 AIRBORNE XT TUNDRA 912 S3

2008, 199 hrs *Always hangered *Excellent condition *Skydat GX2 *Two helmets/ headsets *Microair transceiver *Tall windscreen *Maintenance log *Reg. 26/03/15 *Extras incl: *Custom heavy duty trailer *Heavy duty covers *All cross-country bags *Training bars** $40,000. Test flight avail. w/qualified instructor. Contact Geoff 0409913858.

3621 KR2 ALMOST COMPLETE PROJECT

Registration lapsed KR2 99% complete. Needs prop, some re - assembly, a few brackets and fasteners, odd jobs and paint. Subaru ea81, flaps, tricycle u/c easily re-converted to tailwheel. New canopy. Includes intercom. Nice to fly, cruise approx 120 kts. Menocanflynomore forces sale. $11,500 ono. Martin 0419 333 525

3625 NEW US MILITARY NOMEX FLIGHT SUITS

I have a small number of genuine US military flight suits for sale. These are brand new and made from flame resistant Nomex fabric in Sage Green & Tan Only. Please ring about sizing. Special sale price of $200 each Contact Mark Harris on Ph 0418 345464 or email mbhprods@optusnet.com.au

3627 PRIVATE AIRFIELD

600m private airstrip, Murrumbateman area, 20 mins Canberra, highway access, 12 x 12m hangar, OCTA. House 5 bed, 3 bath, tennis court, 4 car garaging, established gardens. 40ac income producing property, currently running 70 prime lamb ewes. Shearing, machinery, hay, workshop sheds, large cool room, 2 stables. $1.3m. Phone 0432689136

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. $65,000 ono. Phone: Bevan 0428 536 338 Email: bevanlane@bigpond.com

3660 JABIRU J160-C

Immaculate condition factory built October 2006, 570 TT engine and airframe. Well equipped Dynon D10A, Microair transponder, radio, PCAS, autopilot, Garmin GPS, cabin covers. Always hangared, regular maintenance and nil accidents. One owner Jabiru and never used for training. Contact: theo@graftedvines.com.au Mob: 0418 805204. Located S.A. $47,000 + GST

3662 CLASSIC SAVANNAH VG AIRFAME KIT

Classic Savannah VG Airframe Kit. New, complete and still in box - has not been unpacked. $25,000. Call 0419 215 514

3709 NEW HOUSE AND HANGAR - TEMORA NSW

Council maintained airpark, 3 runways, taxiway to hangar. 18.5m x 13m hangar, power, lighting. New brick veneer home fully serviced set in beautiful park surroundings. Four bedrooms, ensuite, modern kitchen with separate butler's pantry. Ducted heating/cooling. Great community, wonderful life style, don't wait. $580,000 inc GST phone 0419 389 311

3728 LIGHTWING GR912S SPORT

Price reduced $40000. Great first plane, easy to fly. Nose wheeled, 550hrs TT, Rotax 912s 100hp, Flaps, Icom A200 VHF radio, Electric turn coordinator, GPS (basic non aviation type, large screen), 3 blade Brolga prop, STOL performance. Contact Gareth Lloyd on 0402845244 (WA) or blue_sky@live.com.au

3735 NORTHERN RIVERS NSW.

Northern Rivers NSW. Property 228 acres. 700m airstrip. Hangar, workshop, all usual farm facilities. Runs 50 breeders. Suit retiree, club, group ownership etc. Dual river frontage. Asking $640,000. For further details, photos etc 0427 115225 or didja@skymesh.com.au

3736 DELIVERY PILOT

DELIVERY PILOT Do you need your RAA or GA aircraft delivered anywhere in Australia? 18000 hr retired professional pilot and RAA aircraft owner , available, best rate going, just need to keep busy. Recent deliveries to NT, QLD, Tasmania, Northern NSW, and WA. Ring Gus on 0414934750

3759 REVMASTER ENGINE

2100 cc. Revmaster VW. The engine is disassembled and consists of mostly new components with many used but serviceable items as well. Too much to list here so if you contact me I can supply full details. Asking $ 3000 and keen to sell. Dean 08 87331235

3766 SPACEWALKER II

"SPACEWALKER II" Something different for the aviation connoisseur! Dual Open Cockpit. Lycoming O-235 Built by retired engineer to better than production quality. Low airframe engine hours. VH-Reg (NOTE: This aircraft can easily be re-registered with RAA) Full history. Absolutely immaculate inside & out. A joy to fly. Ph 0428883311 $69,500

3787 TERRIER 100

Terrier 100 19-3509 485 hours on 100 hp Subaru EA81 engine and airframe. Standard instruments, Garman 196 GPS, Microair radio/ intercom and always hangered. Good condition and is hangered at Woodstock near Townsville QLD. $35,000 Ph. John 0410857103.

3825 RV3-B

RV3B 3B Wing A/F 223 hours - electric flaps & trim Lycoming 0-360 engine -3 blade catto prop -160 knots cruise @ 2350 rpm TOTAL PERFORMANCE phone 0409875926 keneyearsrv4@bigpond.com

3831 JABIRU SK

Like new - only 185 hours TT, 2.2 litre. Serviced and maintained by LAME. Alway hangered. Nil accident. Paint work 9/10. Fuel flow/usage gauge. Sigtronics intercom. Icom A200 radio. Located at Moorabbin. $35,000 Contact Ross +61428394598

3847 JABIRU SP 500

Total hours 420, 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 prs Lightspeed 20xl ANR headsets, large rudder, upgraded undercarriage, always hangared, 100 kts cruise. $40,000. Narrogin WA. 08 98814924 0400014924

3853 FOXBAT A22 LS SHARE

Syndicate share. Our syndicate, run by the members, has been running at Caboolture Airfield, Qld for over 10 years. Our current aircraft is a Foxbat A22 LS with 100hp Rotax, Dynon instruments, S mode transponder, tundra tyres and centre stick. Shares currently available. Please call Chris Pfeiffer for details. 0417621097.

3865 FOR SALE JABIRU J200

Airframe TT520 hours, Factory rebuilt Solid Lifter Engine102 Hours. Recent Jabiru Repaint, Factory Service. GA Panel, Analog instruments, Microair Radio, 2XGPS,Total Fuel 140Litres. Strobe Lights, external power, Cold Start Adaptor, spare Prop. Lovely plane, cruise at 118kts at 21Litres, Heated Cabin. Located Dubbo, $72,000ono contact Jeff, 0418 843954

3869 JABIRU J160

J160 19-4699 L2 built and maintained. This aircraft is in great condition and is fitted with MGL

Stratomastor Extreme EFIS, Microair 760 radio and basic instruments. The aircraft can be inspected at West Sale Aerodrome. Reduced to $42000. Contact Daryl 0466925474, dghooke@gmail.com

3879 FOXBAT A22

Foxbat A22 24-4270 820hrs uhf vhf transponder AH fuel scan lowrance airmap 2000 GPS verticle card compass new prop just completed 100 hrly VGC $62,500 contact 0438981301

3908 X AIR F

SOLD

x air f 19-3276 TT194 hrs Eng 5[illegible]hrs Rotax 618, 3 blade prop, just [illegible] instruments, microair radio 2 x [illegible] 96C Gps, ELB, reg. to 3/15 $10,000 with custom trailer John (03) 97461010 0408351072

3909 ZENITH CH 300

ZENITH TRI-Z 2+2, LIGHT SPORT AIRCRAFT. CRUISE 110 KTS, RANGE 900 N.M. LYC 0-320, ALL ALUMINIUM AIRCRAFT. T/T 32 HRS. ALL OLIO UNDERCARRIAGE, ALL INSTRUMENTS, GPS, RADIO, TXPDR-MODE C, STALL 48 KTS, WITH FRESH 100 HRLY.. CONTACT BOB, 02 64959251 OR boboshkosh@yahoo.com $38,000 O.N.O.

3912 JABIRU 200

J200 solid lifter 350 hrs 3 blade prop power flaps Matco brakes garmin gps and much more. Great cross country aircraft. Best offer 0249486788. Bobbaza@hotmail.com.

3914 JABIRU J 400

First flew: March 2005 TT: 450 hours basic Jabiru instruments with turn co-ordinator radio, transponder, Garmin 295 GPS through bolts done at 442 hours. new piston rings, valves and springs fitted by Jabiru flywheel mod done Price: $50,000 If interested, please contact me Rory on 51551392 or 0448551392.

3926 MAGNIFICENT REVO 912 100HP

Recognised as the most technically advanced trike in the world, this Revo 912 has every conceivable extra. Only 81 hrs always hangared and LAME serviced at Moruya airport. At $75,000 save $20k on replacement cost. Also custom built aluminium trike trailer 7 metre internal $22,000. gary@eldering.net.au mobile 0411550280

3945 AIRBORNE EDGEX 582 STREAK 10,000 AUD !!!

SOLD

Bleuhead 582, full Bert Flood rebuild 125 hrs ago, Brolga prop, Streak Wing, logbooks, manuals, radio and helmets. Everything [illegible] just travelled [illegible] to Brisbane, luggage bag, jerry-can harness, full travel covers. Qld registered trailer with jerry-can holders, toolbox, oils, spares, winch, ramps,... $10,000only! Contact Wim 0417066123 Brisbane voortman.seasia@bigpond.com

3946 SAVANNAH

Rotax 912s 100hp TTIS 390hrs. New 3 blade warpdrive prop. Tundra undercarriage.Long range tanks 7 hours endurancce. 560kg MTOW. L2Maintained. Steam gauges + electric turn & bank. Garmin GPS 196.Xcom radio intercom & headsets. Nil accidents.Always hangered.All books & manuals. Excellent condition.Euroa Victoria. Ph Joe 0427941072 $50.000.

3989 ENCYCLOPEDIA OF WORLD AIRCRAFT

Encyclopedia manuals contains information A-Z of all world aircraft commencing with Kitty Hawk. Some key sections: World civil, private, special purpose and military aircraft, weapons and tactics, technology, history of aviation, air forces of the world, and more. Very good condition. $500 ONO. Further information phone John, (07)40955343

3993 CHROME MOLY TUBING

CHROME MOLY. TUBING - 2 sizes, 7/8 x .035 - 17.16 metres, 5/8 x .035 - 26.98 metres $500.00 neg. Please phone John (07) 40955343

4003 FLIGHT DESIGN CTLS

2011 build. TT 600 hrs. Rotax 912 100HP. Full Glass DYNON Skyview D1000 instruments. Garmin SL40 Radio. Garmin GTX330 Transponder. Garmin GPS MAP695. 2/3 Axis Auto Pilot. Constant Speed Prop. Strobe Lights. L2 maintained. 120 kts cruise. Excellent condition, always hangared. Located Gympie. $118,000 Call Eck 0488 338 895

4005 RV12

RV12, VH-XKH,25Hrs TT,Rotax912ULS,MTOW below 600kg,has AP,Transponder,lighting,interior lining,etc. All components new.Build by multiple RV builder and SAAA technical counsellor.Two pack paint all over white(put your own motif on)Hangared in Mittagong YMIG NSW. Asking $108.000.- no GST If you have any questions please contact me on:0411290472 or 0248844143 or kahamer@bigpond.net.au

4006 J200 6CYL

Still the best Jabiru around. Only 300hr TT. TAS 120kts. 19.5Lt/Hr. Nil accidents.Multi awarded, best Jab Narromine, SAAA best homebuilt Cowra, best home built Jabiru factory award, multi awarded peoples choice.The aircraft has been hangared since new and has full service history. Immaculate condition ready to go. Selwyn 0429 368081

4008 KIT AIRCRAFT FOR SALE

Unfinished project.Featuring strut-braced high-wing,two-seats-in-side-by-side configuration in enclosed cockpit,fixed tricycle landing gear,single engine in tractor configuration.Aircraft is made from

vacuum-molded composites with lightweight aluminium constructed wings.It has 8.7 m (28.5 ft) span wing and a unique zero time Jabiru 3.3 (120 horsepower) engine.Needs cabin assembly and fitout to complete.$20,000.00.onoPh:0417710440 email:robyn_rawson@yahoo.com.au

4011 JABIRU 160 D

As new, immaculate condition, always hangared, service every 20 hrs, New leather seats, Full Carpet, Microair Radio Package, New Sennheiser Headset, On board camera, Garmin GPS, Electric Flaps, Jumper lead kit. 135 l fuel tanks, New 10 ply tyres,Wheel Spats. Can Deliver. john@wholagan.com.au 0419485525

4012 HANGERAGE - COROWA

Hangarage available Corowa Airport. Suit light aircraft. Good sealed runways, Avgas available. Contact Steve on 0429 328053 or steve@corowaflying.com.au

4013 NIEUPORT 11 PROJECT

Fuselage tail plane and two lower wings already built .Enough aircraft grade aluminium to complete upper wings. wheels and plans included.$500.00 Townsville NQ Phone Steve.0412354757

4026 AIRBORNE EDGE X MICROLIGHT

1998 Airborne Edge X Microlight. Rotax 582 2 stroke engine, 486 hrs. Streak wing, Vertex radio, intercom, headsets, helmets, wing covers, trike base covers. Hangared Coffs Harbour. $ 14,000 ono. Ph Tom 0409537440 or email tpieper28@bigpond.com

4028 QUICKSILVER GT500

2 seat in tandem GT 500 in good condition. New upholstery and tyres. 471 air frame hrs. Silver head 582 with 264 hrs. Fabric good condition. Flown regularly. Micro air 760Q radio with two headsets. Based at Dalby QLD. Always hangered. Dream to fly. Ph 0437 738 869. Email greg@braziertrailers.com.au

4033 QUICK SILVER GT500

Quick Silver CT500, registration number 55-640 Two seater with dual gauges and dual controls Rotax 912 UL engine Always hangered Excellent fabric and quality stitching Date of Manufacture 30 October 1996 Hours flown 663 Contact Margaret Hewitt 03 93946757 or vijayantimala@gmail.com Asking price $33,000 (negotiable)

4045 FOXBAT A22LS

Foxbat A22LS.year 2013, white, 24-8344, 100hp. Rotax Injection Engine, Dynon SV1000 with auto pilot, yokes,Icom210 Radio,tundra tyres,L2 serviced, no accidents, top condition,low hours,$106,500 email jonank@live.com.au

4047 WANTED

Wanted 2 seat Bantam anything considered. contact keith 0427 687001

4048 TEMORA PROPERTY FOR SALE

9.5 acres, 3 bedroom cottage needing work, electricity/water/phone all connected. New colorbond 15mx8m shed, concrete floor & water tank, also has dam on property. Directly across the road from airport & Temora Airpark Stage 3 Development, 3.5 Klm's to CBD. $139,000 Ph. 0412468494, email: ninetyo-neairportst@yahoo.com.au for more info or photo's.

4050 AUSFLIGHT DRIFTER A582

Brolga 4 Blade prop, Electric start, 70L Fuel, Intercom, Icaro Helmet. Lots of spares. Aerial seeder and electric dingo bait dispenser. $13 000 Located near Roma Ph 0427 800 373

4056 ESQUAL VM1

Almost completed all glass Esqual VM1. Fast cruising machine. Upgrades to the fuel, canopy frame and throttle system . Carbie heat as well . Rotax 912 with a Rospeller constant speed prop. Wiring done with factory harness .110 litre fuel tanks .Strobe lights Andrew Repton reptonsa@bigpond.com 0409371001 $90000

4057 AIRBOURNE EDGE X 582

AIRBOURNE EDGE X 582 Blue Top. Streak 2B wing; 72 hrs, engine Blue Top oil injection; rebuild 216hrs. included; Icom radio, GPS, helmets , suits, log book & manuals. Windsor NSW $10,000 Phone Mark 0425151420

4058 TECNAM ECHO CLASSIC P92

Tecnam Echo Classic P92 2007 Model, This aircraft is in Excellent Condition and is a Pleasure to Fly, 200 hours on New Rotex 100HP Engine, 755 Total Time,Serviced every 25 Hrs, UHF, VHF, Mirco Transponder, Siren, Intercom, Many More Extras, Always Hangered, $$$ POA Contact Ben, (07) 46554018

4059 GOAT GLIDER

Goat Glider and Trailer. Very Well Built. Easy to fly. Rugged but beautiful Little Plane. Cliff Launch-able, or winch, or Tug or Car Tow. enclosed Trailer with Rego. $5500.oo Wife says sell. see : 'Gold Coast Goat Club' online video's. Ph. Bud : 0413770272 . Can deliver. admin@bud.com.au

4061 SKYFOX CA22

skyfox ca22. new fabric new engine-vw 0hrs nil accidents all ads and annual inspec up to date. trailer if required. always hangered. $27,500 inc gst. 0429 441727.

4063 JABIRU J160 SHARE

A share in a syndicate of 7 in a 2007 factory built J160 based at Aldinga SA. $7000. Always hangared. Level 2 LAME maintained. Go anywhere, cheap to fly. ph Bart 0418816158 bjlewie@hotmail.com

4077 TECNAM EAGLET

Tecnam Eaglet Reg No. 24-7008 Rotax 912 ULS 4 Stroke 100 Horsepower, Total Hours 685 Dynon EFIS D100 Panel, Garmin 296 GPS, Garmin SL40 VHF, Garmin GTX 327 Transponder, Electric Flaps, Electric Trim, Toe Breaks. BurnRate 15 LPH Maintained By A Level 2. $110,000.00 Ono Contact Franco 0400 591 401

4078 FOXBAT A22 LS SHARE

our syndicate has been running at caboolture airfield for over 10 years. The current aircraft is a Foxbat A22 LS. with 100hp Rotax, Dynon glass cockpit, S mode transponder,tundra tyres and centre joystick. shares currently available. please contact Chris Pfeiffer for details.0417621097

4079 JABIRU J160C

Jabiru J160c Rego 24-4766, 1 owner, a/c eng TT 1330, LAME maintained. VGC, Microair radio & transponder, digital compass ASI, VSI, ETC, OIL P/T CHT, ALT, Elec flaps spare prop always hangared, maintenance/flying logs, Nil accidents, $50000 ono, Clifton QLD, Ph Daniel 0409465812 or Daniel@housereports.com.au

4099 JABIRU SP500 6 CYLINDER ENGINE

Great little factory built a/c: 6 Cylinder engine: 100 Litre wet wings: 6 inch wheels: Garmin GPS: Standard Jabiru Instruments: 2 head sets: Fast cross country a/c: Registration expires 05 Sep 2014: Always hangered and located near Kilcoy: Nil accident history: Price reduced to $41000: Contact John 0402-133-742.

4100 JABIRU J200B

Jabiru J200B, 19-3872, Immaculate aircraft, Natfly winner, Solid lifter 3300 engine, 365hrs TTIS, serviced 25 hrly, Full panel, Certified American Instruments, IcomA200, UHF, Transponder, Fuel flow meter, Independant brakes, Custom upholstery, Garmin 296, Two pack paint, carbon prop, Cummins spinner, Always hangered, Must see. Geelong, Vic. $79,000 Ph 0418 131838

4102 RYLSTONE AIRPARK HANGAR RENTAL

Two slots available in late August at Hangar 49 located on the all new Rylstone Airpark. All new, insulated, painted floors, kitchenette for a casual stayover. Rylstone airpark is located 2.5 hours from central Sydney Full details tucano-replica.blogspot.com.au & click on Hangar Rental Contact Gary 02-96221916 AH raf.tucano@gmail.com

4117 AIRBORNE EDGE EXECUTIVE 582

Airborne edge 582, Helmets and intercom, Ivo prop, Tundra tires, Strobe and Landing light, 245 hrs on engine since 500 hr overhaul, Tow kit, Stone net, Full travel covers, VHF Radio, All log books,Full instuments, registered HGFA, Whittlesea, Victoria PH 0418 554872 See flying at http://youtu.be/bD9jUT8R1Bs $7500.00 swillsy@bigpond.net.au 0418 554872

4125 PIPISTREL VIRUS LSA

275 Hrs A/F and Eng, Rotax 912, 120Kts cruise at 13l/hr, 585kg MTOW, 304kg BEW, 25kg luggage, 100l long range tanks, GPS, AI, VHF, mode C transponder, ballistic chute, cabin heat, full composite airframe, punkinhead cockpit cover, lovely to fly, surplus to needs, hangared near Townsville, $69,000 Ph 0497465526

4126 TECNAM P92 RG

Tecnam RG fantastic plane to fly and own fast cruise slow to land full panel 2 radios transponder garmin aera 500 gps, vac DG and AH all work by L2 and L4 friend selling to make room for new plane 750 hrs rotax 912 $88,000 phone Tony on 0429132128

4127 EUROPA CLASSIC

Europa classic only 58 total hrs GA registered but can be Registered RAA full GA panel elec trim,AH,DG,transponder icon radio with intercom and strobe it comes with its own purpose built trailer two new ANR headsets pilot with Bluetooth 125 knot cruse on 13 litres $60,000 phone Tony 0429132128

4128 LEA KESTREL

Lea Kestrel, with 447 Rotax and Sweetapple prop. Complete with enclosed trailer. Aircraft has only flown around 50 hours since built. Currently unregistered, hasn't flown for a while, but only minor work required to return it to the air. Located in Brisbane. $8,000 ONO. Call Doug on 0732063042.

4129 WANTED

PSRU for Subaru EJ22. Consider toothed belt or geardrive. Must be able to handle 130 HP and be in good condition. Phone Chris on 0419486125 or email chrisstewart6@gmail.com

4135 AIRBORNE XT912 TUNDRA CRUZE

Airborne XT912 Tundra Cruze wing. 430hrs. Comes with helmets, head sets, flight suits, training bars, radio, intercom, Punkin Head trike covers. Always hangered (currently at Dixons Creek in Victoria). Transport can be arranged and a trailer may be available to purchase or borrow. Contact Brett 0419610041 Price $38000-

4138 ZENITH 601XL-B FOR SALE WITH 3300A

Only 34hrs TT . LAME / L2 built with 3300A solid lifter. Has KT-76A ,Icom A210 JPI EDM 700 Sensenich prop,Strobes,,Aileron/Elevator electric trims, electric flaps, Grove brakes, Corrosion proofed .Todd's canopy, can be re-registered as ELSA 600kg .Empty weight 372kg. Fuel 92L .Cruise 115 knots .$48000 ono 0402079305

4139 LIGHTWING GR 912 HELIVIEW TAILDRAGGER

Lightwing GR 912 Heliview Taildragger. 2100 hr TT. 75 hrs on NEW Rotax 912. 1925 hrs /14 years remaining. Manual unlocking tailwheel. 6 ply tyres. Fuel flow meter . ICOM A200. ANR Headsets . Wheel Spats / mount hardware. 290kg BEW, 480kg MTOW. L2 maintained.TR/DEL available. $ 45,000 0427113207 Peter

4140 PLAN BUILT SONEX

Plan built Sonex. First flight Dec 09, 95 hours engine and airfame. StratomasterMaxi single instruments, ICOM radio, separate analogue ASI, Cruise 90-95 kts@16 l/hr. Aerovee engine. Located Lethbridge Airport, $30,000, near offer would be accepted. Please contact Ronald Stares 03 9314 3513. Please cotact me by phone only

4143 JABIRU J230D

JABIRU J230D Reg 24-7419 Factory built May 2010, 260 hours, Option 6 Panel, Dynon D180 EFIS Garmin 495 GPS, Microair Radio & Transponder, Twin Strobe Lights, David Clark Headsets, Always Hangared from new. Nil Damage. Contact Ian - 0419703926

4144 SWAP KENWORTH FOR SKYFOX

classic w model kenworth prime mover yr 1983 new tyers to many new things to list value over $50.000. consider swap for skyfox taildragger in exellecent condition as new with trailer.No screaming two srtokes have to be something special. 0427369688 skmurdoch@hotmail.com

4146 FLIGHTSTAR IISC

Brand new, one of the last ones to come from the US. Assembled with excellent attention to detail. Fully enclosed cabin, dual controls, custom carpet interior, Falcon instruments, in-flight trim, brakes & mylar coverings. Not fitted with an engine and will be sold as is.Best reasonable offer. 0412 506 242

4148 SYNDICATE - EXPRESSION OF INTERESTS

Wanted: Enthusiastic, safe and friendly aviators to form a 4-way share syndicate in the Brisbane/Gold Coast area. Goals: (my suggestions) -Purchase a modern, safe, reliable aircraft -Flexible, fair, effective time sharing -Exclusive use for share holders -Sustainability of the syndicate -Pride in ownership! Est. investment approx $25000-$30000 Contact: aaronleech@live.com.au

4149 CESSNA150H

for sale 1967 cessna 150h, eng and prop 300hrs tr, full panel, new paint and int, corrosion proofed, new batt, will be sold with fresh 100hrly and all ads will be up to date. phone 0427200640. no text i will not answer, no dreamers please.

4150 LIBERTY XL2 GA REGO, FULL IFR CAPABLE

2007, 67hrs TTIS. Hangared Maitland NSW. 75% cruise 23.5lph, 120kts, 445nm+reserve. 55% cruise 18.9lph, 105kts, 535nm+reserve. Payload 189kg plus full fuel 106l usable. IOF-240-B FADEC fuel injected. Full IFR, Garmin instruments GNS430, SL30, GMA340, GTX327. Leather. 48" cabin, wider than Cessna 210, very comfortable, adjustable pedals. Price $82,000. Don 0412618405.

4151 582 ENGINE 99 MODEL (BLUE HEAD)

Engine has only 13 hours since new,with reconditioned c type gearbox from whirly damaged drifter. Four blade brolga prop thrown in.Owner has new aircraft.Engine is located in a box in a hangar near thargomindah.

4152 AIRBORNE EDGE X 582

Airborne Edge X, TT 235 hrs Streak wing. Aircraft in excellent general condition and includes a GPS map 96C, near new Icom radio and 2 Micro Avionics helmets, EQ1 wireless comms and 2 wireless headsets (value $2500), custom trailer (unlicensed). Cruise 50kn. located York , WA - $15,000 ono 0400440375

4153 CLASSIC SEAREY FOR SALE

new engine 2014 (912 ULS-3) TBO now 15years,2000hrs whichever comes first. Always Hangared, new condition, spares, tools, seaplane kit, full instruments,moving map GPS. A$90k ono. Long Range Fuel Tank, Ground Power, build supervised by retired TAA engineer. Can do CASA and RAA endorsement.Ph Jack 0414 737 400

4154 EVECTOR SPORTSTAR

Evector Sportstar , new Rotax 912, new Warpdrive propeller,new Matco wheels and brake system. Airframe 3200 hrs. VGC. $80,000.00 0419646833 schneider4570@gmail.com

4155 TAILDRAGGER

19 registered single seat. T/T 62 hrs, 503,o/haul 8 hrs ago. Get your tail dragger time up in this easy to fly plane,cruises at 55 knts and nearly lands itself! Radio, instruments. Wings remove in 30 mins for trailering. Could deliver to Melbourne. $7000.00 0417 513 414 or 036326 2589

4156 JABIRU SP500

Beautifully built &professionally maintained, always

hangered,one owner,250hrs,all mods,all flight&engine instruments inc GA panel with Garmin GPS,radio/intercom,transponder,vac pump,artificial horizon,turn&bank,fuel gauge,fuel flow meter,cabin&elec carb heat,85 Lt fuel,2Pac paint,quick release wings.$35,000.Ph 0418573212.

4157 RAGWING RW19/20 PROJECT

RagWing RW20/19 Stork STOL Project in 1/2 places. completed Wings/ Rudder/ tailplane completed in sitika spuce. Enough hoop pine and ply to complete and build another aircraft. All metal tubing, wheels with brakes and 2 EA81 engines. Located 100km from Melbourne. Paul 0410525062 $3800 Neg

4158 ZENITH CH 750

Zenith CH 750 Is GA too expesive to operate? Maintain your own Precisely built designed MTOW 655 Stall 35k cruise 85k.110 lit. fuel .Continental 0200 Sennsenich prop. Dynon EMS GPS ICOM 210. Bush tires.STOL. Ideal spotter or muster.bubble doors , flies doors off. .More on RAAUS marketweb-site. $72000 Call 0413306684

4159 SIERRA 100

Reg 19-7658 Jab 2200A (New) Thompson Prop. Matco wheels and brakes. Icom A210 radio and in-tercom, headset and Magellan GPS. Test hours only (As New) always hangered (no longer flying - age). A gift at $25000. Gawler SA 0885222505

4160 SPRING SALE

EXCALIBUR.582 as new. Wide tandem body. Elect flaps. Instrument package. Quick detachable clear doors. Exp. Builder. Hangared last 6 years. Offered at $29,900. Robin. Upper Hunter Valley. (02)65466012

4161 AIRBORNE EDGE 582

AIRBORNE EDGE. Excellent condition. 156 TT Streak 11 wing. Tundra wheels. Detailed log book. Icom fixed mount radio. Intercom. Two headsets and helmets. Training bars. Punkin Head covers- wing, base, prop. Garmin 196 GPS. Custom trailer. Location Hartley. Fly out or trailer. $20.000. Aden 4784 1098

4163 JABIRU LSA55

Economical factory built LSA55 licensed for training. Motor removed. Transponder. 100kn cruise. Spats fitted 2009. New prop 2010. Repainted 2011. Comes with good carby, ignition system, sump & box of assorted engine parts. Nearly full 65L tank of fuel. Ready for transport on any car trailer. $25000ono lincpike@gmail.com 0402385554

4164 HIRTH 3701 EFI

Hirth engine model 3701 electronic fuel injection 100hp. Only 10hrs run. In as new condition but requires new computer. Complete with full exhaust system. No gearbox. Several photos available. Call or email to view photos and further information. $6,000. Phone 0408 124 350 or email texmango@gmail.com

4165 FLYSYNTHESIS STORCH S500

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4166 THRUSTER GEMINI

Up for sale is my thruster as i have upgraded. Great little two seater aircraft to fly and would suit a low hour pilot. Can endorse tailwheel if needed. See ra-aus web site for more details or call wayne on 0458118938 .

4167 BRUMBY 914 TURBO

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4168 X.AIR 3194

Rotax 503 Engine. 403 Hours TT. E/AF. Std. Instru-ments Radio, 3 Blade Brolga Prop. 55/60 cruise Rego Oct 2015. Good order. 503 performs well. Good fun machine. $12500 Phone Horsham VIC 0353824766

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To mark the 100th anniversary of the start of World War 1, *Sport Pilot* offered a special 3 DVD boxed set '4 Years of Thunder' to one reader.

The series covers the traumatic events of 1914 -1918 as they unfolded in the air above the trenches. Includes the flying aces, the death defying dogfights and the dawn of the age of carpet bombing.

Lindsay Boyd of Lake Macquarie sent his email on September 15, the correct date.

Thanks to everyone who took part.

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JANDAKOT
S32 30.505 E115 49.957
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Holder: James Murphy
Email: murphyjuk@hotmail.com

$17.3 BILLION

Total economic contribution of Australian airports to the economy in 2012.

Source: Tourism Australia

118 MILLION

The number of passengers at Australia's 11 largest airports in 2012.

Source: Tourism Australia

100 KG

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Source: aerochute.com.au

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OFF THE SHELF

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For more information http://www.aeromobil.com

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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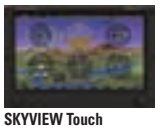

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