

SPORTPILOT

RECREATIONAL AVIATION AUSTRALIA / OCTOBER 2016 VOL 62 [10]

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Bruce Clarke's latest project, a full scale replica Nieuport 17 at the Brisbane Valley air show. Powered by a 2275cc VW engine. The original plans were by Graham Lee from Canada.
Photo: Alan Betteridge

ON THE COVER

18 Inaugural air show success
ALAN BETTERIDGE

"The decision to change from the popular Gathering of Eagles fly-in to a full blown, two day air show was a success"



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EDITOR

Brian Bigg
editor@sportpilot.net.au
All enquiries 1300 838 416

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admin@stampils.com.au

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REGULARS

- 5 Chairman's report
- 6 Calendar of events
- 9 Letters to the Editor
- 66 Happy Landings

NATIONAL SAFETY MONTH

- 38 Introduction
- 39 Why are we doing it all over again?
- 40 Hangar talks
- 41 Safety summit
- 41 Safety competition
- 42 How to prepare your beacon
- 43 Hangar talk presentation
- 43 First aid

COLUMNISTS

- 44 Tech Talk
OLEG DESHIN
- 50 Pilot Talk
THE OPS TEAM
- 52 Design notes
DAVE DANIELS
- 57 Professor Avius
- 59 Home Builder
DAVE EDMUNDS

NEWS

- 12 RAAus at Oz-Kosh
- 12 RAAus AGM details
- 12 SP back on the stands
- 13 5 months to go for old manual
- 13 Another CASA boss goes
- 15 Blackshape names local partner
- 15 Digital directions
- 15 Student pilot wanted
- 17 New insurance partnership

FEATURE STORIES

- 26 Why should I have a radio?
PETER AND ANNE MCLEAN
- 29 Craters
RICK FRITH
- 34 The X Factor
ROB KNIGHT

FLY-INS

- 18 Inaugural air show success
ALAN BETTERIDGE
- 45 Fly in to DIA
STEVE ALLEN

READER STORIES

- 24 From 0 to solo in 6 days
CURTIS OLIVER

EXTRAS

- 23 RAAus board election results
- 32 Poster opportunity
PETER GIBBERD
- 63 Members' market
- 64 Where is CAGIT?
- 65 Off the shelf





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HEAD OFFICE

PO Box 1265 Fyshwick
ACT 2609 Australia
Unit 3, 1 Pirie Street
Fyshwick ACT 2609
International: +61 (2) 6280 4700
National: (02) 6280 4700
Fax: +61 (2) 6280 4775
Email: admin@raa.asn.au
www.raa.asn.au

NATIONAL FINANCE AND ADMINISTRATION MANAGER

Maxine Milera
admin@raa.asn.au

CEO

Michael Linke
ceo@raa.asn.au

NATIONAL OPERATIONS MANAGER

Jill Bailey
ops@raa.asn.au
0400 280 087

ASSISTANT OPERATIONS MANAGER

Neil Schaefer
ops@raa.asn.au
0428 282 870

NATIONAL TECHNICAL MANAGER

Darren Barnfield
techmgr@raa.asn.au
0417 942 977

ASSISTANT TECHNICAL MANAGER

Jared Smith
jared.smith@raa.asn.au
0418 125 393

NATIONAL SAFETY, RISK AND COMPLIANCE MANAGER

Katie Jenkins
safety@raa.asn.au
0418 445 652

ENQUIRIES

General Enquires:
admin@raa.asn.au
Aircraft and Maintenance Enquires:
tech@raa.asn.au
Pilot and Membership Enquires:
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ARBN 070 931 645
ABN 40 070 931 645

EXECUTIVE

Michael Monck (President)
0419 244 794
Michael.Monck@raa.asn.au
Tony King (Secretary)
0400 226 275
Tony.King@raa.asn.au
Barry Windle (Treasurer)
0408 842 308
Barry.Windle@raa.asn.au

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The organisation it should be

BY MICHAEL MONCK

Many members don't really care about the board, they just want to go flying. Having said this, a few years ago, some of the board's decisions meant I couldn't go flying. I figured a few years on the board myself might be worth considering, so I could see what the board did and how it operated.

Board members are often referred to by different titles ranging from the obvious - board members - through to less common terms - governors. While the latter term is not common, it is somewhat enlightening - in that board members govern. For the most part, though, board members are called directors which also shines light on what they should be doing - directing.

Directors who direct, don't actually do much themselves. Instead, they make decisions about what needs to be done. The role of managing falls to managers. A director who is governing properly will make decisions about the direction of the organisation and strategy, deciding on policy and keeping an eye on things to ensure each of these things is done in accordance with the decisions which have been made. Essentially it comes down to making a decision and monitoring its implementation. It sounds pretty straightforward, but it can be tricky.

Sometimes we have to make decisions based on incomplete information. Sometimes there is too much. Two recent events may help to illustrate the difficulties.

In the lead up to the recent elections we did research on how to run the process properly, the timing of it, how to communicate correctly and so forth. After the process had started, I received a call from a member who told me he was a lawyer and that he had concerns about how the election was being handled.

We had taken advice from experts in the field and had proceeded on the basis of what they told us. Section 189 of the Corporations Act says we can rely on professional advice, as long as we do so in good faith and arrive at our own conclusions about the advice. That is, each director has to make his or her own decision and think for themselves. So what happens if someone else comes along like this and says something different? We obviously must consider it. So I did some

due diligence. I checked the credentials of the person asking the question and discovered he wasn't currently practising law. So I deferred to the advice we had received from people who were current.

Similarly, we had a process to go through when we revised the delivery method for this magazine. We had to weigh up the competing demands of providing a magazine while protecting the financial viability of the organisation. We spoke to people via surveys and considered the options they put forward. Some said we should force everyone to pay a substantial increase on their membership fees. Others said they would be pleased to receive just an electronic copy. In the end we went with a hybrid model where people could subscribe to the magazine but no one would be forced to. Incidentally, those who do subscribe get the magazine at slightly below cost price, so it is still being subsidised by all members.

So it is easy to see we have to make decisions with either incomplete information or way too much. Both make it tough. And when we do make the decisions, two more things happen. Firstly, a lot of people make derogatory comments in email, online and via the phone. Secondly, the decisions have to be reviewed.

Reviewing decisions is something we should always do. We're human and will make bad decisions. We will make errors and, quite frankly, anyone who doesn't believe that is dreaming. So we need to look at what we've decided on and, in light of what information becomes available after that choice is made, consider whether it is still the right one.

We did this recently with the receipt of election ballot papers. We had set a due date of the end of August but then experienced an unexpected delay of around two weeks because of changes to Australia Post delivery timeframes. So we reviewed our decision and, to allow members a reasonable amount of time to respond, made the call to accept ballot papers posted by the due date even if they arrived later.

When I started on the board, I was critical of some decisions made by previous boards. These included giving every board member a free ASIC, paying for board members' partners to fly to meetings

and accommodating them at members' expense and having an open bar for the board after meetings. In 2013, the year I started on the board, our audited accounts said we lost more than a quarter of a million dollars. It seemed ludicrous.

Similarly, we had made commitments to CASA we then ignored. Days after I was welcomed onto the board, I was made aware of 12 areas in which RAAus had made commitments, ranging from addressing the tendency for board members to interfere in safety matters, through to maintenance issues. None of these had been addressed despite, in some cases, CASA granting us multiple extensions. As a result, we faced strict sanctions by the regulator.

Understanding this history is important. We need to know about the things we've done, what has worked and what hasn't. We have to be willing to adjust our decisions once we have more information. The new board will be charged with this responsibility, but because you chose who will be on the board, you will need to know who is doing a good job and who is not. In the past you didn't get that information until it was too late. Even when you find that your aircraft is grounded like I did, you may not know who is at fault.

We'll be working to change that by giving you information on participation and input at the board level. Who turns up to meetings, whether they're face-to-face or online. Who actively participates in the decision making processes. And who delivers things on time. In other words, you'll have the information you require to make your own decisions and review them. That way we can work together on the long term fixes RAAus needs to make it into the organisation it should be. ✖



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CALENDAR OF EVENTS



A. 8-16 OCTOBER SKYDIVE RAMBLERS EQUINOX BOOGIE

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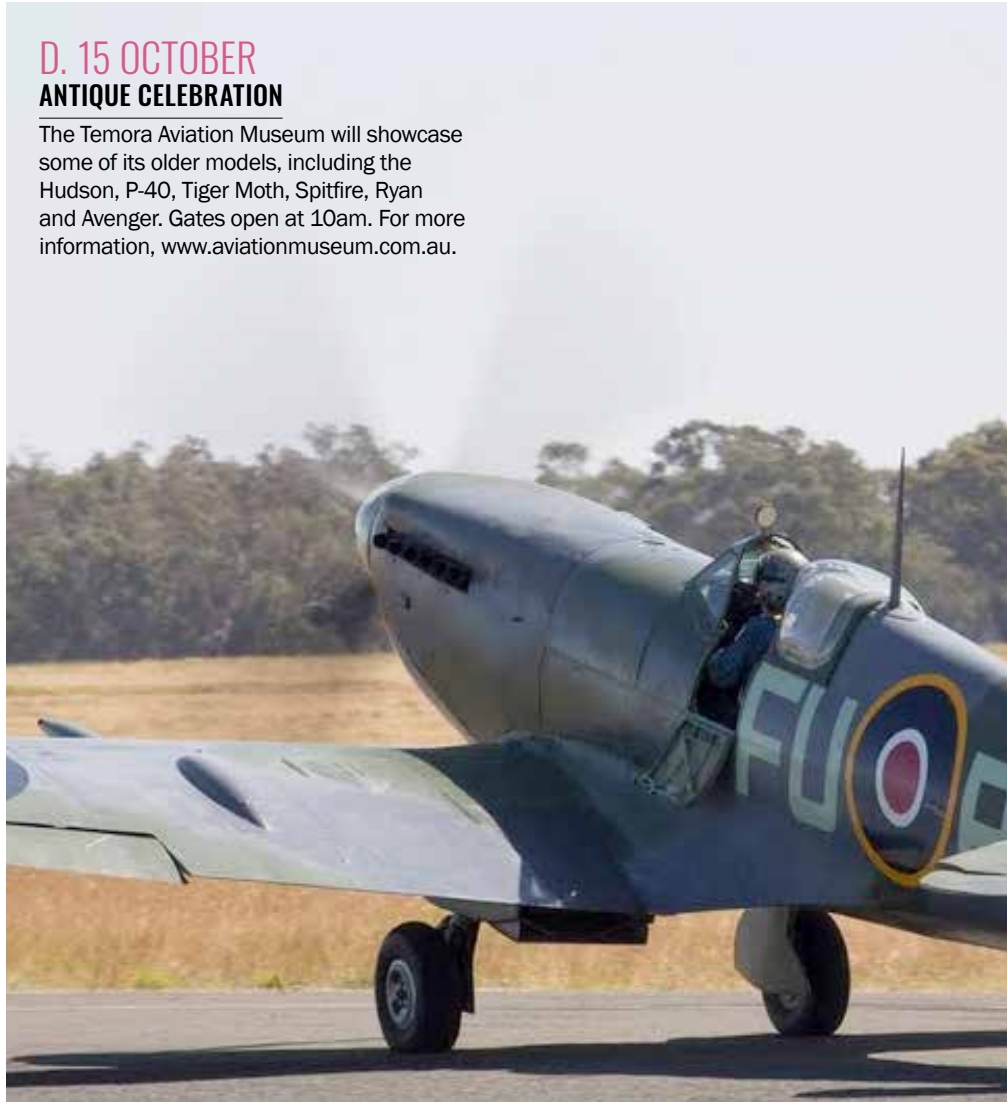


B. 15 OCTOBER RAAF TOWNSVILLE AIR SHOW SPECTACULAR

The event will celebrate Townsville's 150th birthday and its long relationship with the RAAF. Fireworks and live music along the town's foreshore. RAAF Base will hold an open day the next day. The last time the city and the air force put on a show like this, 70,000 people turned up. For more information, www.airforce.gov.au/Interact/Displays/Air-Shows.

C. 15 OCTOBER SKILLS MAINTENANCE DAY

Yarrowonga Flight Training Hangar 19. Topics include Aerodrome Operations and Flight Radio. Lots of freebies from CASA, ATSB, Airservices and RAAus. Lunch (\$10) at 1200. Seminar (free) until 1600. For catering purposes RSVP 03 5744 1466.



D. 15 OCTOBER ANTIQUE CELEBRATION

The Temora Aviation Museum will showcase some of its older models, including the Hudson, P-40, Tiger Moth, Spitfire, Ryan and Avenger. Gates open at 10am. For more information, www.aviationmuseum.com.au.



E. 15-16 OCTOBER PORT LINCOLN AIR SHOW

Two days of mind blowing, high speed action. From old to new with jam packed action and adrenalin pumping pyrotechnics. Aerial action by Judy Pay and Paul Bennet. For more information, <http://portlincolnairshow.com.au>.

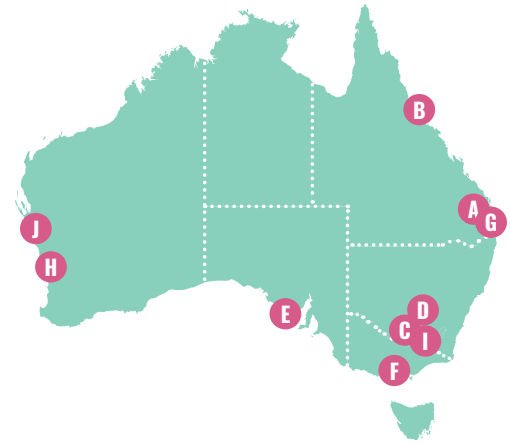


CALENDAR OF EVENTS



G. 28-30 OCTOBER WAI AUSTRALIAN CONFERENCE

Women in Aviation International (WAI) is focused on introducing more women into aviation. Two day conference in Brisbane. Welcome drinks Friday evening. Tours of the AirServices simulators and control tower, along with tours from Boeing, including a virtual reality simulator and training demonstration. Dinner and river cruise Saturday. The guest speaker program on Sunday will include people from all aspects of aviation. More information, waiaustralia.org.



I. 26 NOVEMBER MT BEAUTY FLY-IN

Everyone is invited to be part of a unique fly-in/fly-out airports event at the finest mountain airstrip in the Victorian Alps. Fly-in to join a group of fellow aviators with a passion for air sports. Be prepared to share, experience, learn and have fun. There will be a unique mix of sport aircraft. Sat night runway dining event. For more information, 0417 084 400.



H. 29 OCTOBER SUPERLIGHT FLY-IN

The Superlight Aircraft Club of WA invites pilots of all aircraft types to Bindoon Airfield to help the club celebrate its success at purchasing its airfield. On display will be club member aircraft including VH, RAAus, GFA and ASRA registered. Also a large display of vintage, veteran and classic automobiles from Perth car clubs. Food and beverages. Pilots are welcome to stay overnight. Bring your swag and some stories to tell. RSVP no later than October 14 to club secretary, Robin Greeney robin@greeney.net or (08) 9279 2984.



F. 22-23 OCTOBER INDOOR FLYING EXPO

Channel 31 newcomer 'The Flying Show' will host an indoor aviation expo at the Melbourne Showgrounds. Exhibits will showcase the history of aircraft, including John Delaney's Wright Brothers Flyer replica project. Also exhibits on powered parachutes, gliders and paragliders, RAAus aircraft, model and hobby aircraft, drones, flight simulators, skydiving, hot air balloons and parachuting. More information, theflyingshow.com.au.

J. 8 APRIL 2017 VALLEY VIEW AIR DISPLAY

Valley View Farm, Northern Gully (23kms East of Geraldton Airport). Will feature joy flights, military equipment, skydivers, model aircraft, Light Horse display, 11th Battalion AIF - Leane's Trench Tours, produce, food and drink stalls, bouncy castle and face painting, free camping. For more details, www.valleyviewvintage.com.au or our Facebook page.

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LETTERS TO THE EDITOR

OUTLANDERS

In the last magazine (*Sport Pilot* September 2016) you had three very interesting articles, one especially, titled the Trip. This article talked about the fun of flying an ultralight. The pre-planning, the ground crew, the weather and the fuel stops, the hot cuppa and then the next leg. All members who fly or flew ultralights know of the fun and the friendship that is generated by these trips. Having the planning down to a fine art for out-landings and fuel stops. The Barossa Birdmen Ultralight Club (name now changed to satisfy Jabby owners) a few years ago used to do exactly what was described in the article, load up Emma the Drifter with sleeping gear, extra fuel on the spare seat of the Thruster. With the two Tyros and two trikes in tow we'd head off for a weekend.

Our aim was to attempt to get to Nulla Station some 1.25nm from Truro Flats. I am yet to remember a trip when someone did not have to practice their out-landing skills - Airmanship put into practice. The fun was in getting there, the sitting around the fire telling flying stories while having a BBQ for dinner with the occasional flyer from the Sunraysia flying club. The next day was to repeat what had happened previously (but with no out-landings) and get home, usually into a strong westerly wind which started around 10 am. Keep up the good work.

IAN SHAUGHNESSY



radio manners and information. Our CFI stresses two things above all else, safety and airmanship and it paid off in aces. I negotiated a very satisfactory fee for landing, parking and a great meal at the Altitude Cafe in the Terminal. Local TV and the Daily Toowoomba Chronicle both gave good coverage to the exercise.

Wellcamp, being almost 3km long and 50m wide, offers an unique experience for students who wish to expand their skills and the Lone Eagle Flying School at Clifton offers them this and more. Pilots and passengers came (by our invitation) from near and far including Boonah, Goondiwindi, Redland Bay, Archerfield, Brisbane, Redcliffe, Caboolture, Gayndah and Coominya.

On assembling in the terminal, we were all given and appreciated, an address of welcome by John Wagner, Chairman of the Wagner conglomerate of companies.

He stressed it was an open airport where anyone could land without prior consent. Of course the airport did get special consent and permits etc from CASA for our event - to enable us to come enmasse. I have also begun discussions with Wellcamp to make this an annual event.

Even so, I expect that within two or three years it will grow to be an international airport with controlled airspace, making it more difficult to stage this event. My advice to all is to come to this event next year or you may miss out! (Hopefully the last Saturday in July).

Obviously the chance to land a light single engine aircraft on the same runway as a jumbo jet (but not at the same time) acts as a magnet to all aviators.

Having enjoyed a great meal and wonderful camaraderie for a couple of hours we all left again, mostly to enjoy more fun and fellowship in the hangar at Clifton, while the distant flyers went directly home. My task was made so much easier because I enjoy an excellent relationship with Katlin McCullough of airport management. She is to be commended and congratulated.

To see five aircraft in the landing circuit with five and six in line astern taxiing to the terminal, then later five or six following to the take off point, will long live in the memory of a lot of people.

KEVIN MCGRATH
(ABLY ASSISTED BY JAMES BANGE AS CO-COORDINATOR)

ON THE STANDS

Ducked into my local newsagent to get an OzLotto ticket this weekend - a recreational aircraft will be my first purchase when the numbers come up - and decided, as I usually do, to pause by the aviation section of the magazines.

Imagine my surprise when I saw *Sport Pilot* in its old spot. It's been ages since the magazine was on the stands and it was like seeing an old friend. It looks great too. This is a seriously good magazine. It kept me browsing to the point that the newsagent coughed and I had to buy it to finish the article I had started reading.

ALL WELL AT WELLCAMP

On a cold Saturday morning I registered pilots and passengers together for a scenic flight to Wellcamp Airport. In minus 3 degrees frost, my bios refused to work, but it was all done and dusted for the briefing at 9.30 am. It had taken four months to put this together with Wellcamp and when the day arrived, it was a glorious day with brilliant sunshine, cloudless skies and a two knot breeze.

A total of 32 aircraft assembled and, after the briefing by the CFI of Lone Eagle Flying School, we took off with the slow (50-80 knots) leaving first, then 80-100 knots second and 100-120 knots next. They flew respectively at 800, 1,300 and 1,800ft above ground level over the townships of Clifton, Nobby, Greenmount, Cambooya, Wyreema and Westbrook and then on to the Wellcamp Airport. A sight to behold - 32 aircraft with pilots and passengers all landing within a half hour of each other.

Full credit to the pilots who all flew in a safe and professional manner with excellent





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LETTERS TO THE EDITOR

Is *Sport Pilot* back on sale for good? Or will I have to subscribe to get it? I saw it online but it's not the same.

K DICKES

FROM THE ED / I'm happy you bought your copy, K. A newsagency is not a library, you know. *Sport Pilot* is back on the newsstands as a trial for September, October and November. Depending on how sales go during those months, the CEO will make a decision on its future in the newsagents. It will be a purely financial decision. You really should subscribe. All the smart people are doing that.



occasions, he or she should know how to learn the answers to these situations. Although risk management is taught, is it practiced? Is it solidly ensconced in the brains of pilots? If emergency procedures do not cause an instinctive reflex action the event may well end up in tears. This applies not only students but any pilot, be they RAAus or GA trained.

Here is where we get to the training part. Students may be shown and practice engine failure after take-off, in the circuit or during normal flight. But are they taught to the extent that their actions to any of these events becomes automatic? A good question pilots can ask themselves while flying is - if the engine were to stop now do I know which way to turn for a forced landing? During a cross country flight do I instinctively keep track of suitable forced landing fields as I go or do I only look for a field if the engine fails?

The only way pilots can increase their reflex action is through practice. How many pilots carry out emergency procedures on a regular basis? Engine failure would be the most common emergency pilots may practice, but what about all the other events that can happen. I could list many emergencies that should be practiced, but it would be difficult to create a general list which covers all aircraft. Each type of aircraft has its own peculiarities and warrants pilots practicing because many of the emergencies which can happen to the aircraft they are flying.

I will mention a few emergencies which can be fatal. For a start, what if the C of G is out of limits on take-off? When would I notice and what would I do? How would I fly an aircraft with a jammed control? Do I know the principles of ditching and have I ever

practiced ditching procedures? How do I recover from a difficult situation while flying up a valley? What do I do if there is a fire in the aircraft?

The above emergency situations are just some of the events that should be practiced on a regular basis until they become instinctive. Before starting an emergency practice, talk to more experienced pilots and instructors to make sure that you practice the correct technique for your aircraft. Also, know when to terminate the practice. We do not want a practice to end up in a tragedy. The motto is 'practice makes perfect' and that certainly applies to aircraft emergencies where every second counts. It has saved my life on more than one occasion.

We all know that flying is fun but if you, as a pilot, do not learn something while flying it is time to give up flying.

OWEN BARTROP

PRACTICE MAKES PERFECT

I read with interest the article 'National Safety Month 2016' (*Sport Pilot* September 2016).

While the article indicates the need for better safety in aviation, it fails to mention the core causes of accidents. Certainly it mentioned the 44 fatal aircraft accidents due to human factors over the past six years and the six areas that will be tackled to increase safety. But it fails to cover the two most important factors in accident prevention - Airmanship and ongoing emergency training.

By Airmanship, I do not mean human factors, whatever that term means. I mean knowing the answers to questions arising from flying, anticipating unusual events, instinctively knowing the correct procedures to recover from unusual events and being able to survive possible situations.

Airmanship no longer seems to be taught under its own name and, as a consequence, many pilots give it scant attention. Not only should a pilot know what to do in all unusual

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CLEAR MIND CLEAR PROP

WRITE IN: EDITOR@SPORTPILOT.NET.AU

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.

(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).



RAAUS AT OZ-KOSH

7-9 OCTOBER NARROMINE AIRPORT

RAAUS has always been committed to a member based fly-in and NatFly was put on hold to allow the organisation to explore options. Partnering with like-minded aviation bodies was seen as an excellent opportunity to breathe life back into events like NatFly and AusFly. As a result Oz-Kosh, an old style fly-in for members, was born.

RAAus has partnered with the SAAA, the HGFA and the APF to bring you entertainment, a limited airshow and an environment centred on getting members out to meet, greet and rekindle friendships.

The event will combine more than 35 exhibitors and more than 45 seminars.

RAAus will be there in force. It will be particularly interesting if you have an interest in aircraft design, construction and/or technology, or you would like to enhance your knowledge by networking with, and learning from the industry's most influential suppliers, service providers and technical experts.

Four venues will host presentations and workshops over the weekend, some of it in a dedicated RAAus member's area. There will be presentations and forums in a number of key areas.

- The future of RAAus: an update on our recent organisational reform and information on our plans for the future;
- Safety Summit: find out about our safety strategy, safety improvements and occurrence reporting;
- Runway Loss of Control/ Normalisation of Deviance: a seminar focusing on two crucial areas and providing valuable information to help you become a better pilot;
- Weight and balance and the new Technical Manual: a discussion of the new manual and information on how to weigh and balance your aircraft.

To review all presentations and workshops the weekend has to offer, visit the Oz-Kosh website and register for any events you're planning to attend.

NO RAMP CHECKS?

CASA says attendance at Oz-Kosh by representatives of its Sport Aviation department will not include any scheduled or planned conducting of ramp checks.

However, as with any aviation event, the attendance of CASA officers will also involve oversight of all aviation activities and operations.

CASA says if there are any observed breaches of the regulations or any observed safety concerns, such occurrences may result in a ramp check being conducted.

CASA has told RAAus it is not possible for it to promise that any such ramp checks which may be conducted will be for educational purposes, only that where possible this will be the case.

RAAus reminds pilots that any serious breach of the regulations or genuine safety concern may result in further action being taken by CASA.

BACK ON THE STANDS

SPORT PILOT magazine is back on the newsstands for a limited time.

CEO Michael Linke, approved the trial to gauge the response from the public to the magazine, which continues to be Australia's best aviation publication.

Sport Pilot was last sold publicly in 2014. Since then it has been available free of charge on issuu.com, to members via the web portal and the hard copy by subscription only. The hard copy continues to grow in popularity. There are now more than 2,000 subscribers nationwide. At one point in July, the office registered 100 new subscribers in just two weeks!

Because of its growing popularity, 3,000 copies of *Sport Pilot* were distributed to newsagents across the country in September, with the same number going out this month and November. A decision on whether or not to continue after that will be made when the results of this trial are known. Keep your eyes out for it. And if you want to find out which newsagent closest to you is stocking the magazine, go to the RAAus website.

In the meantime, if you want to subscribe to *Sport Pilot* at any time, after all it is Australia's best aviation publication, email admin@raa.asn.au.

RAAUS ANNUAL GENERAL MEETING

Aldinga AeroClub, Aldinga Airfield, Colville Road, Aldinga SA 5173
15 October 2016, 4.00pm to 5.00pm

AGENDA

1. Opening of the meeting
 2. Receipt of apologies and proxies
 3. Confirmation of quorum
 4. Declaration of the result of the election
 5. Minutes of last Annual General Meeting
 6. Business arising out of the minutes of the last Annual General Meeting
 7. Presentation of Annual Reports
 - Chairman (see annual report)
 - Audited Financial Reports (see annual report)
 - CEO (see annual report)
 8. Appointment of Auditor
 - Resolution: That RMS Australia (Canberra) are appointed auditors of RAAus Ltd
 9. Close of Annual General Meeting
- Prior to the AGM members are welcome to attend our inaugural Safety Summit, commencing at 2.00pm
- After the AGM we will be hosting a member Q and A session.
- Members are also invited to stay on for the



free maintainer of the year awards BBQ (a cash bar will operate) from 6.00pm until 8.00pm. The Board and CEO of RAAus will be on hand to answer questions and provide further details about the future of RAAus and plans for the coming year.

The Safety Summit and AGM will be live broadcast.

SCHEDULE FOR THE DAY

2.00pm to 3.30pm

Safety Summit

4.00pm to 5.00pm

AGM

5.00pm to 5.45pm

Member Q and A Session

6.00pm to 8.00pm

Maintainer of the Year BBQ





FOUR MONTHS TO GO FOR OLD MANUAL

THE RAAus Technical Manual V4, released in August, will operate concurrently with Version 3 until February 1.

There are various clauses allowing for the status quo to remain in place during the phase-in period.

Key changes to be aware of:

In order to continue to maintain your own aircraft, you must have completed the L1 Training Module before February 1. This doesn't apply to members completing line maintenance only.

RAAus will soon release a Weight and Bal-

ance online education package which is a requirement of Version 4 for anyone who plans to weigh RAAus registered aircraft (including L2s).

The process for initial registration of amateur built aircraft has changed. New amateur built aircraft where the construction commenced after August 1, 2016 will need to comply with the process outlined in Version 4, section 3.1. Staged inspections and a Permit-to-Fly scheme have been introduced.

Processes for major and minor modifications are clearly outlined in section 6 of Version 4.

A number of new registration prefixes may apply for newly registered aircraft under Version 4. More information about registration numbers can be found in Section 5.1.

Additionally, check out Section 9 for information recording aircraft maintenance activities, which is a new addition to this version.

As we move toward the phasing-out of Version 3, feedback and comments on the new manual are welcome. A feedback form and more information about the new manual can be found in the member portal on the website.

ANOTHER CASA BOSS GOES

CASA has burned through yet another boss.

CEO and Director of Aviation Safety, Mark Skidmore, resigned suddenly at the end of August, citing personal reasons, including wanting to explore a number of new opportunities.

"I have decided the time is right for me to make this move. I came on board at CASA to lead the organisation through a period of significant and difficult change and I am very proud of what we have achieved through the transformation program. We have been able to reshape the way CASA operates and delivers its services in a positive way," Mark said.

"It is an appropriate time for me to hand over the leadership as CASA moves through the next phase of its improvement program" he said.

Mark was only in the job for a year and a half. His departure continues the revolving door trend in CASA's top job, widely regarded as the toughest and most thankless job in aviation.

His main task was to lead the transformation of the safety authority in line with the government's

response to the Aviation Safety Regulatory Review (ASRR).

CASA's Board thanked Mark for his contribution to CASA and Australian aviation.

"Mark has made an enormous and valued contribution to CASA and to aviation safety in this country", CASA Chairman Jeff Boyd said.

"This has included a number of significant improvements including restructuring the organisation, the development and implementation of CASA's new regulatory philosophy and the implementation of just culture throughout the organisation. This has contributed positively to the way aviation regulations are developed and implemented in consultation with the aviation industry".

Shane Carmody was appointed Acting CEO and Director of Aviation Safety until a replacement is found.

Mark was due to continue in the role until October to allow for a smooth leadership transition.



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BLACKSHAPE NAMES LOCAL PARTNER

ITALIAN aircraft manufacturer, Blackshape, which featured in *Sport Pilot* last month, has made a decision on who will represent them in Australia.

Angelo Petrosillo, Blackshape CEO Sales and Marketing, said the company had made a deal with Precision Light and Air through Tooradin Flying School.

“Blackshape is finally coming to Australia” Angelo said. “After a hard and thorough due diligence process, Precision Light and Air has been appointed as Blackshape’s agent for Australia and New Zealand.

“Now we are ready to market our prod-

uct in Australia at the top level”.

The Blackshape BK-100 Prime achieved approval from RAAus earlier this year.

Angelo says that makes it the first full carbon fibre sport and leisure aircraft approved by RAAus.

“The Prime is the fastest light sport aircraft in the world, the only fully prepreg hot melt carbon fibre manufactured, awarded best aircraft in the world in its category in 2013 and a bestseller in the tandem seat light sport aircraft category”, Angelo said.

“We are proud to finally start the market-

ing of the top class aircraft in the world in its category” said Nick Waugh, director of Precision Light and Air.

“The first two aircraft will join Tooradin Flight School, Blackshape’s headquarters in Australia, by the end of the year and will be displayed at 2017 Avalon Air Show. Two more aircraft will come next year”.

The purchase price of the Blackshape is yet to be finalised, but indications are that you won’t get much change out of \$250,000.

For more information: www.tooradinflyingschool.com.

DIGITAL DIRECTIONS

THERE are many ways in interact with RAAus these days.

Website: <https://www.raa.asn.au/>

Member portal: <https://members.raa.asn.au/login/>

Lodge an occurrence: <https://oms.raa.asn.au/lodge/>

Back issues of Sport Pilot:

<https://www.raa.asn.au/sport-pilot-magazine/>

Subscribe to printed Sport Pilot:

<https://www.raa.asn.au/sport-pilot-magazine-application/>

RAAus shop: <https://shop.raa.asn.au/>

Sport Pilot online:

www.raa.asn.au/sport-pilot-magazine

ENewsletter: <https://www.raa.asn.au/become-a-member/member-benefits/e-news/>

STUDENT PILOT WANTED

HAVE you just started out on your aviation journey? Can you tell a good story about it? *Sport Pilot* is looking for one or more student pilots to share in the duties of writing a Learn to Fly column each edition.

For the past couple of years we have followed the adventures of Anthony Sibary and Shannon Leglise. And while Anthony still flies and files for the magazine regularly (and we hope continues to do so), neither pilot is a beginner any more.

We need some fresh young (or old) perspectives on the fear and excitement that is becoming an ab-initio pilot. Someone who can ignite the hopes and dreams of wannabe pilots who read *Sport Pilot* every month and think it may never happen to them. If that’s you, write up 500 or so words as an example and mail it to editor@sportpilot.net.au. Join the team on Australia’s best aviation publication.



INSURANCE AND SAFETY PARTNERSHIP FOR RAAUS MEMBERS

PSB Insurance Brokers is pleased to provide a new insurance program for RAAus members, underwritten by QBE Insurance and Allianz Insurance with the Members Liability Insurance at its centre.

The partnership has safety at its core with Australian Red Bull pilot and RAAus member, Matt Hall delivering a number of safety initiatives.

For a range of Aviation insurance solutions, including Aircraft Hull, Top Up Liability visit psbgroup.com.au for instant cover* or call **(08) 8271 9677** | **(03) 8841 3303**.

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PSB Insurance Brokers, together supporting RAAus and its members.

* Subject to acceptable underwriting criteria - AFS241402





A NEW INSURANCE PARTNERSHIP

FROM MICHAEL LINKE, CEO

As part of our ongoing business review, RAAus is always on the lookout for the best deal for members. With this in mind, we are very pleased to announce a new partnership with PSB Insurance Brokers, QBE and Allianz Insurance.

Commencing from October 1, PSB will become the RAAus insurance broker of choice for a range of products used by RAAus to secure protection for its members. Coupled with this new partnership with PSB is an enduring partnership with QBE and Allianz designed to keep RAAus pilots safe and enhance our safety programs and communication. Working with legendary Red Bull Racer Matt Hall, also an RAAus member, together we will deliver a range of key safety promotions to enhance the organisation's overall safety culture.

We are very excited by this new partnership which, at its centre, is RAAus' liability insurance, a cornerstone of protection for members. This policy offers pilots comfort and protection as they traverse our great country landing more than 450,000 times a year.

Pilots will get comfort for each of these landings knowing RAAus, PSB, QBE and Allianz are there for them.

FROM PSB



PSB is excited to be the insurance broker of choice for RAAus. We look forward to working with RAAus and its members to provide, not only insurance services across the existing

Members' Liability program, but also additional services and products such as Aircraft Hull and Top Up Liability Insurance now available through our Innovative On-Line System.

Furthermore PSB supports RAAus' strong safety culture and has made a commitment to RAAus that it will receive remuneration for any business placed through our On-Line Facility which will assist RAAus with both existing and future safety initiatives.

PSB is committed to working together with RAAus and its insurers to develop additional products for

the protection of RAAus' members, such as cover for L2 maintenance providers and Group/Individual Life cover for pilots. We are happy to investigate other member needs, if you have any concerns/ideas please give us a call.



FROM QBE

QBE Insurance is delighted to be part of this new safety partnership with RAAus. As Australia's largest

aviation insurer, we understand the unique needs of the sector and look forward to sharing our expertise with RAAus members. QBE has proud history of partnering with industry associations and investing in safety. We acknowledge the hard work Michael Linke and his team have undertaken over the past two years to improve and promote safety among members. To build on this momentum, we are investing in programs and providing our Airmanship Ambassador, Matt Hall, to work with RAAus on a number of important safety initiatives.

This is a true partnership where all parties have a common goal and part to play in making recreational aviation safer. We look forward to meeting with many RAAus members and discussing the new partnership at Oz-Kosh and around the country.



FROM ALLIANZ

As a global leader in aviation insurance, Allianz truly understands

aviation and aviation insurance at all levels of the industry, from hang gliders through to spacecraft. With aircraft owners, pilots and engineers among our global aviation team, we have unique insights into the challenges and risks which face the aviation community. As a result, our commitment to aviation safety and excellent claims service is unparalleled.

We are excited about working with RAAus and our partners on this new insurance initiative and are impressed by the improvements and initiatives introduced by RAAus over recent years to ensure we all fly safer and get home to our families. ✈️

Inaugural Air Show success

STORY AND PICS ALAN BETTERIDGE

WATTS Bridge was home to the inaugural Brisbane Valley Air Show in August and the decision to change from the popular Gathering of Eagles fly-in to a full blown, two day air show was a success.

The decision was not taken lightly by the organising committee but the move was rewarded by the large crowds which attended.

Thousands of people flocked to the event both on the Saturday and Sunday, with many arriving on the Friday and taking advantage of the camping facilities.

It is interesting to note the majority of people who decided to fly in did so on Saturday, with

many departing during the scheduled break in the display at lunch time.

One couple who flew down on Saturday and set up camp under the wing of their Jabiru J230 were Col and Donna Johnston.

Col, who is a member of the Isis Flying Club, took just over one hour to fly down from Childers, near Bundaberg.

"I learned to fly with Russ Middleton at Pro-Sky Aviation in Maryborough four years ago and have never looked back," Col said.

"Both my wife and I love flying and purchased our Jab about three and half years ago."

The only problem they encountered – as did

everyone who camped overnight – was the cold.

"The days are superb but it was only three degrees this morning," he laughed. "But we survived."

The ever jovial Julie Hands from Heathrow Field on the Whitsunday Coast decided to build the air show into her and partner Ian Wells' trip around Queensland in their treasured Savannah XL, appropriately named Cab Sav.

"We are on the final leg of our circumnavigation of Queensland," Julie said.

"We flew right around the border, with a few side deviations into the Northern Territory and South Australia.

"The trip has taken us four weeks and has



Ready for action – Nieuport 17 and Sopwith Pup



Very neat and tidy RV12



Builder extraordinaire Bruce Clarke with his latest creation



Well-travelled Savannah XL



L39, Yak 3 and P41 Mustang each put on impressive displays

been fantastic.”

Julie, Ian and Cab Sav are no strangers to long distance travel. They have flown around Australia three times already - and are not showing any signs of stopping their travels anytime soon.

“I don’t know where we will go next – but we will go somewhere, that’s for sure.”

Asked about the unusual name of her Savannah she said it was simple really:

“Our little aeroplane is just like Cabernet Sauvignon – a smooth wine that travels well.”

Mike Saunders, a member of the Callide Dawson Flying Group from Mackay, flew down to meet up with the Cab Sav crew and accompany them back.

This was Mike’s longest trip since completing his Nynja in October 2015.

“I have 80 hours total flight time. This is my longest trip yet and it went really well,” he said.

“It gets along at about 90kts and the trip took me 4.7 hours to get here. The Nynja is the perfect aircraft for me and I love it.”

Another intrepid aviator who flew over from Heck Field on the Gold Coast in his unmissable lime green X-Air was Jason King.

“It took about 50 minutes to make the trip and weather is just unbelievable,” he said.

Two of the big crowd pleasers on static display were the Sopwith Pup and Nieuport 17, belonging to Bruce Clarke.



An exciting newcomer to the RAAus fleet is the Bat Hawk from South African company Micro Aviation



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Col and Donna Johnston flew from Childers in their J230 Jabiru in near perfect weather



A small, but enthusiastic, crowd attended the RAAus forum to hear about some exciting changes coming for the organisation



Bruce is a well-known aircraft builder and mentor to many others in the process of building their own aircraft.

"The Nieuport 17 is built from plans which were up-scaled by the late Graham Lee from Canada," Bruce said.

"I had to make a few minor changes but I think the end result was worth the trouble."

Bruce's long suffering wife Mary said she wished he would just stop building aeroplanes because she was the one who did all the rib stitching on the fabric - not an easy task.

"Rib stitching is a dying art and Mary is very good at it - she loves it really."

Mary just laughed and shook her head at her husband's comments.

RAAus had a presence at the show and held an information forum for members.

CEO Michael Linke, Secretary Tony King and Assistant Operations Manager Neil Schaefer explained to a small but enthusiastic crowd about the changes in the pipeline for the organisation.

Tony explained the push to get a new category of aircraft with a MTOW of 1,500kg - to be called group G.

"The group G aircraft will be a separate category from our current groups, in particular group A.

"As we all know, group A has a MTOW of 600kg but must have a stall speed of no more than 45kts.

"It is the stall speed factor which is the key."

Michael said the new category would not affect any current category A aircraft unless the owners wanted to.

"If owners want to keep doing what they have been doing that's fine, there will be no changes," Michael said.

The forum also discussed the current state of play with the plan to give RAAus registered aircraft access to CTA.

Tony said the process was underway and members would see the results soon.

"We have a situation where many of our members learn to fly at controlled airports and so know the procedures, but as soon as they get a Certificate they can't fly in there anymore. That simply doesn't make sense," he said.

In closing Michael said the next six months would bring some great changes and members would be fully informed as they happened.

"All I can say is that it will be an exciting six months ahead."

The decision to change from a fly-in to an air show was clearly popular with the people who attended and the organisers should be proud of what they achieved.

But I can't help feeling that the air show lacked one thing the old Gathering of Eagles fly-in had in spades - a feeling of comradeship and easy going.

Maybe it was the perceived threat of the ever watchful eye of CASA staff, or the many CASA induced restrictions on where you could and could not go, which made the difference.

Either way it was different and maybe thought should be given to holding another GoE style fly-in during the year in conjunction with the Brisbane Valley Air Show. ☹️



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ELECTION RESULTS

RAAUS LTD 2016 ELECTION RESULTS

RAAUS CHAIRMAN, MICHAEL MONCK HAS ANNOUNCED THE ELECTION RESULTS

THE RAAUS BOARD OF DIRECTORS FROM OCTOBER 15 WILL BE:

- Michael Monck - Chairman
- Eugene Reid
- Barry Windle
- Rod Birrell
- Tony King
- Luke Bayly
- Trevor Bange

FULL RESULTS:

RANK / VOTES / SURNAME			RANK / VOTES / SURNAME		
1	529	King	6	387	Schox
2	526	Bange	7	351	Bretland
3	495	Reid	8	328	Mazzochetti
4	458	Birrell	9	254	Finlayson
5	399	Bayly	10	201	Allinson

FIRST BOARD MEETING

BY MICHAEL MONCK CHAIRMAN

RAAUS LTD was legally constituted on July 26, 2016. On August 10, the board held its first meeting in accordance with its obligations and responsibilities as defined in the constitution. The business of the meeting focused on the administrative functions of the board and many decisions were deferred until the full board can be formed in October after the AGM.

This meeting will be held in South Australia in accordance with the usual conventions of the organisation. The board has, in the meantime, covered off on some matters relating to the governance of RAAus Ltd.

A policy document detailing the expectations of board members was accepted. The document outlines director's obligations to ensure they act in the interests of the organisation and its members in a proper manner. It also details the responsibilities of key people, including the CEO. This document will be reviewed by the board frequently to ensure it remains relevant to the needs of RAAus and its members over time. A members' charter was also adopted which details a similar set of expectations for members.

Both of these documents can be found here <https://www.raa.asn.au/our-organisa->

MEMBER CLASS	VOTING RIGHTS	FEES
Ordinary member	Yes	Yes
Life member	Yes	No
Honorary member	No	No
Affiliate member	No	Yes

tion/our-constitution/.

In addition, the board resolved to create four member classes consistent with the new constitution. These classes are summarised in the table above.

There are no changes to the rights of ordinary members, they still retain voting rights. As well there is no change to the requirement to pay a membership fee. The change to member classes also recognises the contribution of life members by granting them voting rights, while making no change to the granting of free membership. A new class of member called Honorary Members has been created. This class may be used to recognise certain people who may become a patron of RAAus without having any privi-

leges attached to their membership. The final class of membership is for affiliates who may be clubs, schools or businesses. This class will be required to pay a fee and is consistent with the old constitution of RAAus Inc., in that it has no voting rights.

No changes were made to the fees for the member classes.

The board has also resolved to preserve the by-laws of RAAus Inc. with these being captured in the governance documents. This includes the protection of a member's right to attend and observe board meetings in accordance with the special resolutions approving the change from an incorporated association to a company limited by guarantee. ☺



From 0 to solo in 6 days

BY CURTIS OLIVER



My instructor, Eugene Reid (right) congratulating me after my first solo

SO you've been dreaming of becoming a pilot? Until just a few weeks ago, so had I.

I came across an aircraft which suited my requirements and at a price I simply could not refuse. The decision was made to stop dreaming, to start doing. I purchased it.

So then what? I wasn't a pilot. Not yet at any rate!

So many flying schools, so many different instructors and a few differences in pricing. How would I decide?

Fortunately for me, I have a background in aviation from my father, a recreational pilot with many year's flying remote controlled aircraft and nearly 12 years in the Air Force. This gave me at least a little insight when making my decision.

Firstly, I was hoping to learn on an aircraft as close as possible to the one I had just purchased. All aircraft are different and I wanted the minimum number of surprises when becoming familiar with my own. Next, I was hoping to be able to fly as often as possible. Not just because I had an aircraft and was itching to fly it, but flying often, as with learning any new

motor skill, would help me retain and reinforce what I was being taught. It would also save me the cost of having to refresh last week's or last month's lesson.

After spending some time online and having a chat with a few of the local flying club members, I came across Freedom Flight, in Georgetown, Tasmania.

Not only did the school use the same model of aircraft I had just purchased, but they also had accommodation just a few minutes from the airport in which I could stay while I was there as a full time student.

Yes, I did just say full time student.

Many of you may not have considered this option with regards to the training of an RAAus pilot, but after my experience, I could not recommend a better way to get started in the world of aviation.

I joined RAAus as a student pilot on April 14, 2016 and flew from the mainland to Tasmania two days later. I began flying lessons a day after that and went solo on the 22nd. That's right, from naught to solo in six days.

Flying two to three lessons per day (mostly three) and studying for ex-

Lunch in the hangar after locating an electrical gremlin



Learning to land and take off safely from a narrow, grass field

Checking the oil level as part of my pre-flight just before taking mum for a fly



“A full-time student flies for three days and studies for three”

ams in between, made the learning process streamlined. Having the bonus of being away from normal day-to-day life made focusing on flying my only priority for that period of time.

As most people work eight hours a day, by comparison, a full-time student flies for three and studies for three. It is not really a lot to ask, especially considering the amount of fun I was having while learning.

CFI Eugene, to my liking, emphasised the importance of safety: from the all-important weather forecast, the pre-flight inspections, right through to the flying itself. I was taught how to fly in great weather, but we also tackled a few not-so-perfect days which was great for my confidence.

Along with the flying and studying, being a full-time student meant I was around aviation and its characters every day. With my background as an aircraft Maintenance Engineer, I was able to assist in the diagnosis of a small electrical issue on another pilot's aircraft and, in return, was offered lunch.

The lessons and the steep learning curve, along with the intensive practice, continued up until my flight test on May 2. I passed and joined

the ranks of recreational pilots.

If you check the calendar you will see my journey lasted just 16 days. But, if you disregard the two days I couldn't fly due to bad weather, it was actually only 14.

Since returning home I have been able to continue flying with confidence, feeling quite safe while picking the better-than-average days to get airborne. I did the wise thing and took a local instructor with me on my first flight in my own aircraft, not only to have an experienced pilot handy if required, but more so to show me around my new home airfield, the new training area and to point out any of the neighbours I need to avoid to help keep the peace between the airfield and the locals. (Cheers, Anthony from Lethbridge.)

I've even managed to take my son, my dad and my mum for a fly.

At the time of writing, it's about a month since my first flying lesson and two weeks since my flight test. I now have just over 40 hours in my log book and have booked in with Eugene at Freedom Flight to return next week to take the next step and learn how to navigate cross-country. 🚀



WHY SHOULD I HAVE A RADIO?

BY PETER AND ANNE MCLEAN

In my flying career, almost every aircraft I have flown had a flight radio. So basically, I have been brought up with a radio in each and every aircraft... except my hang gliders.

I hear some pilots say using a radio is a waste of time and money, and that they serve no real purpose.

This is fine and CASA allows aircraft to operate at certain altitudes and from certain airfields without radios. Most of the Ag pilots I know now have a radio but hardly use it, unless they have to.

So why have a radio and why should you use it?

The main reason is that it gives you the chance to eavesdrop on the airwaves, to establish who is in the area, what the weather is doing and, in an emergency, you have a means of telling someone where you are.

Of course, there are always down sides. You would have to know the frequencies and this means you will have to invest in an ERSA, charts, or an EFB. All of this costs money. So you would have to weigh the good against the bad.

I have seen midair crashes happen because an aircraft did not have a radio. Glider pilots have had their fair share of incidents and there have been deaths due to pilots not being able to communicate with other gliders or tug aircraft.

I think you can see where I am coming from, and yes, my view is that all aircraft should have flight radios. So allowing for my preference, let's look at the way to use your radio, if you have one.

First the fundamentals. Wavelength, frequency, amplitude, sound waves and radio waves. Look up that technical information if you want or need to. In over 50 years of flying I have never had anyone ask me about wavelength, amplitude or any of the other subjects above except for frequency, so I won't bore you with the information.

Here are the basics. We use VHF (Very High Frequency) radios in our

aircraft (for the technical reader the band is 30MHz to 300MHz). The VHF radio gives you a high quality line-of-sight communication, which however, is usually short range. This means you can communicate between aircraft and a ground station, or aircraft to aircraft. The rule of thumb with VHF transmissions is an aircraft at or below 5,000ft AGL will have VHF coverage range of approximately 60nm. If you take the aircraft up to 10,000ft you should increase that range to around 90nm, but these are only rules of thumb. The other things to consider about the range of your radio is the type of antenna you use and where it is mounted, as well as the terrain over which you are flying, because these have a dramatic effect on the range.

There is VHF-NAV equipment in some radios as well, like VOR (VHF Omni-directional Radio range) and the NDB (Non-Directional Beacon) and the ADF (Automatic Direction Finder). Again a number of these nav aids are being phased out, so I won't go into how they work. Some pilots use hand-held radios, but remember the only legal hand-held radio you can use at the moment is the Icom A-15.

The airspace is setup in sectors. You have Controlled Airspace or Control Zones (CTA). If you are a recreational pilot you don't normally fly into Controlled Airspace. However, you do fly in Uncontrolled Airspace (OCTA) and you do fly in and out of Common Traffic Advisory Frequencies (CTAF). The CTAF means you must have a radio to enter that airspace or aerodrome. CAAP 166-1 and CAAP 166-2 explain the reasoning behind the changes. A CTAF normally covers a radius of 10nm around the aerodrome and up to around 5,000ft above ground level. However you will need to check the individual CTAF information in the ERSA.

If you look at charts like the ERC Low (Enroute Low Chart), VNC (Visual Navigation Chart), or the VTC (Visual Terminal Chart) you will see the airspace is divided into sectors. Each sector has one or two radio fre-



quencies written into a Navigation Box. The box is outlined in green with two frequencies, one in green and one in brown. At the bottom in green is the location of the outlet. The brown coloured frequency is Class E airspace and the green coloured frequency is the airspace below the E Class airspace. When you are flying around, you should listen to the area frequency or FIS frequency. You should also monitor the local CTAF you are flying near. I always monitor the area frequency even when I am in our local area, because this gives me a heads up about who may be around when it's time for me to head back into the circuit. I like to know who could interrupt my day. There are few things worse than arriving at the aerodrome, seeing a disabled aircraft on the runway and knowing I have to find an alternative. If I had listened to the area frequency I would have been given the information by Airservices, which meant I could have planned for an alternative earlier.

So what if you have a radio in your aircraft, but you are reluctant to use it?

It's understandable. You don't want to make a mistake, or make a fool of yourself. Don't worry there are no 'radio police'. At the same time, you need to always try and use the radio in the appropriate manner. Keep your conversation short, clear and don't be over-polite. You don't need to say "please" or "thanks". These words just take up air time unnecessarily.

When spelling a word, use phonetic spelling - you know, Alpha, Bravo, Charlie and so on. These words are not used just because they sound good. They are used because they are unique words which cannot be easily mistaken. So improvising by using Bob instead of Bravo is not helpful and may, in fact, be confusing.

Also don't rush your conversation. Take it slowly. If you don't understand a transmission, ask for it again, by saying "say again" and if you

are asked to repeat your transmission, start by saying "I say again". There are a number of standard words and phrases. If you listen to the radio chit chat you will pick them up or, if you prefer, buy the AIP or the new VFRG book. These two publications explain it all for you.

Has this ever happened to you? You are flying along enjoying your flight, when smashing through the airwaves comes a broadcast.... "Victor, Charlie, Golf Cessna flying near Yabba North 2,700 heading for Shepparton". And then the airwaves go silent. What would your reaction be? I know what mine was.... "Damn, he's on an intersecting track to mine". But did I remember his call sign? No. All I could remember was a rushed broadcast with something about Yabba North (I saw on my map I was flying near there). The altitude was similar to mine and he was heading for Shepparton. In other words, he was going to cross my track. The first thing I started doing was to scan the sky to get a visual on that aircraft. I couldn't see it. So my next reaction was to place a call. But what to say? Remember, I didn't catch his call sign. My call went like this;

"Aircraft in the Yabba North area Trike 8722 is tracking Shepparton for Yarrowonga at 2,500ft. Overhead Yabba North". This gave the Cessna a chance to respond to me and, more importantly, he now knew there was another aircraft in his airspace with an intersecting track. Most times this happens to me, I do get a response and this time was no exception. The Cessna pilot got back to me, amended his altitude, we both got a visual and we passed each other without incident.

But if his initial broadcast had been a little different, and slower, I would have picked up more information. I would have liked to have heard it like this; "Yabba North traffic. Victor Charlie Golf, Cessna 172 tracking 5nm north of Yabba North for Shepparton at 2,700ft, Yabba North".



Pioneer 300 panel



GT Lite panel



PulsR panel

That type of broadcast would have given me a massive amount of clear, useful information. The first is the “Yabba North traffic”. He is near me. Secondly, the registration and type of aircraft. If I missed the registration, I would still get the type of aircraft. A Cessna, but more importantly a 172. So I knew the profile of the aircraft I could look for, and possibly a speed range. Thirdly, the track. From Yarrowonga to Shepparton. I could look in the direction I was heading. But it was not necessary because the other pilot said “Tracking 5nm north of Yabba North”. A quick look at the map or EFB, and I would see Yabba North, just over my left shoulder and the Cessna 172 heading for Shepparton. This means he would pass me on my left. The fourth and last bit of information, was the altitude. 2,700ft. I was at 2,500ft, so we had 200ft separation. Or did we? I could only hope my QNH was the same as the Cessna’s. Either way I would make a broadcast and let the Cessna pilot know my own information. We each could now make an informed decision on what manoeuvre to make next.

So before you make a broadcast - think about it and then, when you do speak, don’t rush it. Take it slowly, so all the other pilots listening in can make sense of what you are trying to communicate.

What you need to get across is: Where I am - Who I am - What I am doing - Where I am, again, (so if the listener missed the first part of the broadcast he will pick up where you are with the last part. If you are in his immediate area he can ask you to repeat it. That’s the important stuff.

CAAP 166-1 & CAAP 166-2 or in the AIP and VFRG, is where you will find all the calls you need to make when approaching a CTAF. Remember that, on entering a CTAF, you must give your call by 10nm not 9nm. You could make the call at 20nm if you like, and don’t forget to give your estimated time of arrival. If you will arrive in the circuit at 59 minutes past the hour you should say “Expected circuit time 59”, or if you estimate it will be on the hour, you should say “Expected circuit time on the hour”. When giving your circuit calls it is on the Base call when you must give your intentions (full stop or touch & go). This gives an aircraft behind you time to plan their own turn onto base for final.

If you intend to join on Base or do a Straight-in Approach, remember you must give way to all circuit traffic, and you must know the wind direction and strength before making your approach. Don’t forget when

conducting a Straight-in Approach, your last call should be at 3nm. All you need to broadcast is: “Yarrowonga Traffic Trike 8722, three mile final, (“full stop” or “touch and go”), Yarrowonga.

There it is! You can see the flight radio is nothing to fear. For pilots it is just a tool of our trade.

I use my radio frequently. I often contact flight service to get a clearance or find out the QNH and they have always been very helpful.

I also use my radio to talk to other aircraft. When on a fly-away we use a dedicated chat channel. This means all the pilots on the fly-away can talk in plain English without infringing the normal area or CTAF frequencies.

One thing to remember when testing your radio. Don’t do it on the CTAF frequency. Change to a discreet frequency. That way you will not broadcast to everyone on the CTAF with your “Test, 1,2,3”. I can tell you it’s very annoying for pilots doing circuits to hear you constantly testing your radio. If you do need to test your transmission, simply ask for a radio check and someone will give you a readability check from one to five.

So next time you’re flying around using your radio, remember to think about the information you would like to know about another aircraft near you. This information is what you want to tell other pilots. Process it, perhaps even rehearse it. Press the transmit button and wait while you count “one” (so you don’t cut off the first piece of information you transmit) then take it slowly. You don’t like it when someone rushes information you need to hear, so keep your own broadcast simple, slow and precise. That way it will be useful to the people to whom you are communicating.

And if you haven’t got a radio? You don’t know what you’re missing. ✕

NOTE: Periodically, CASA and Airservices will, after much consideration for aviation safety, elect to alter radio frequencies and boundaries, radio techniques, or even methods of delivering radio communication, right down to when to make a call and what to say at each stage of approaching a landing area. These changes are reflected in charts and in the ERSA as they are implemented. Far more important than fear of being caught out and fined, it is an excellent reason to make sure your documentation is kept up to date and that you always fly using the current published information.



Cessna 150 panel



XT-912 panel



Foxbat panel



FEATURE STORY

Lake
Acraman

CRATERS

[AND OTHER INTERESTING GEOLOGICAL FORMATIONS]

BY RICK FRITH

ONE of the special privileges flying your own aircraft in the outback is the opportunity to see some unique sights. Some of my favourites include the meteor craters and other geological features visible from the air.

The most famous crater is probably Wolf Creek, about 100kms south of Halls Creek, at 19°10'S 147° 47"E . At just under a kilometre across, it is about 300,000 years old and extremely well preserved. While in the area you can visit the Bungle Bungles, Lake Argyle and the Kimberley. Avgas and accommodation are available at Halls Creek, or Yuendumu and Tilmouth Well if you are coming up the Tanami Track.

Equally spectacular is the massive Gosses Bluff, 160km west of Alice Springs , in the midst of the MacDonnell Ranges at 23° 50'S 132° 19"E. This ancient crater formed 140 million years ago and has now eroded down to a rugged 5km wide structure, best viewed from about 3,000ft agl. When first formed it is thought to have been over 20kms across. Nearby sights include Kings Canyon, Uluru and the spectacular tiger country of the MacDonnell Ranges themselves. Avgas and accommodation are available at Alice Springs (Class C airspace), Ayres Rock Connellan (which has a control tower, but is not controlled airspace) or Tilmouth Well. Accommodation is also available at Curtin Springs and Kings Creek station.

When visiting Gosses Bluff, it is worth a detour to view the Henbury Craters, 120kms south east at 24° 24"S 133° 9"E. This cluster of about a dozen craters, ranging in size from seven to 180 metres, formed 4,500 years ago when a large meteor broke into fragments before hitting the ground. Nearby is Chambers Pillar, named by John McDowell Stuart after his sponsor, as he mapped the way north across Australia. If heading south, there is a convenient lunch stop at Kulgera Roadhouse and Avgas at Cadney Park Roadhouse.

Heading further into South Australia, you will find Lake Acraman, roughly 160kms east of Ceduna in the Gawler Ranges at 32°0'S 135° 25"E. This heavily eroded impact crater is perhaps the least spectacular, as it is now simply a circular salt lake about 20kms across. When first formed about 600 million years ago, it is thought to have been 40 to 90km wide. Just east, Lake Gairnier is also worth a visit and nearby accommodation includes Mt Ive Station, with Avgas available at Ceduna, Streaky Bay, Port Augusta and Whyalla. If heading further east, be sure to call in at Arkaroola in the spectacular Flinders Ranges for Avgas and accommodation.

My favourite formation is the tiny Veevers Crater in the middle of the Gibson Desert at 22° 58"S 125° 22"E. It is only 20m across, but is considered one of the best preserved small meteorite craters on earth. Due to its remoteness, it is also a challenge to visit. The only other interesting features in the region are Nipper's Pinnacle, a rock formation 130kms south east and Well 33 on the Canning Stock Route to the north. An abandoned air strip at the Patience No.2 oil well was unserviceable when I inspected it from the air in 2014. Accommodation is available at Kunawarrtji (a most welcoming remote community near Well 33) and nearest Avgas is 400kms south east at Giles or 520kms west at Newman. Drum fuel can be shipped into Kunawarrti by prior arrangement.

There are many other craters in Australia, but most of them are very old, heavily eroded and barely visible from the air. Foelsche Crater in the Gulf of Carpentaria was a big disappointment, but the nearby Lost City and unnamed rock formations made the side trip worthwhile. Also the notorious diversion of the MacArthur River around the open cut pit is nearby. Avgas and accommodation are available nearby at Borroloola.

If you are in the west, there is a most unusual arrangement of rocks near Myrup.

Other craters which seem worthwhile, and I am yet to visit, include Boxhole, north east of Alice Springs, Goat Paddock, an eroded 5km depression in the Kimberley and Liverpool, south west of Maningrida. There is also the tiny Dalgara Crater in WA which I hope to see while en route to Woolleen Station next winter.

But in reality, they are all simply an excuse to do more touring. ✈



“They are all simply an excuse to do more touring”





FEATURE STORY



Gosses Bluff



Unatural Stone Formation near Myrup



Bungle Bungles



The Lost City



MacArthur River



Henbury Craters



Outcrops near Borroloola

BLOW INTO THE BAG

A unique photo (staged!) of my Searey
at the Lake Boga fly-in

Peter Gibberd



POSTER OPPORTUNITY

Want to see yourself or your aircraft larger than life on your clubhouse or bedroom wall? *Sport Pilot* is offering subscribers the chance to show off their favourite aviation photo in this double page centre spread of the magazine each month. Each

edition one photo will be chosen (We will try and make sure every photo sent in gets a run). If you are an aircraft seller, it's a great chance to show off your product. If you have a fancy paint job, now is the time to show it off. And if you have a great photograph of

you and your mates at a fly-in, it will make a good memento. Send your photos (As separate jpeg attachments please) to editor@sportpilot.net.au. It obviously has to be in landscape, not portrait, mode and be as big a file as possible please.





X THE FACTOR

BY ROB KNIGHT

SUDDENLY I was spitting as bits of dry grass were blown into my mouth. I was running up an X-Air582, a two-seat ultralight with side by side seating in an open, shallow depth cockpit. Around its wide windscreen was blowing a combination of slipstream, ambient crosswind and mown grass. This was the basic X-Air model, flapless, sporting a basic instrument panel, and pulled around by a 65hp Rotax 583. It was the proud possession of my friend John Orr, a businessman from Mt Tamborine in Queensland.

With the engine popping, as Rotax 582's do at low RPM, I quickly ran through the limited checklist of pre-take-off items. When it was finished, a lookout showed no other traffic so I advised the CTAF that I was lining up and rolling on 04 at Boonah.

Alone, with half fuel and a 10kt headwind, the acceleration was rapid. In seconds, I lifted the nosewheel and the aircraft flew off the grass at 35kts after a ground roll of only about 40m. The VY in the book is 38kts, but I let the ASI settle at 45 to ease the load on the newly rebuilt engine. Established in the climb and trimmed, the VSI indicated a steady 820fpm upwards.

When I turned left to leave the circuit, I found I didn't need a ball to tell me I was slipping. The airflow swirling around the windscreen ruffled my hair (what I have left) and told me quite eloquently about my state of slip/skid. However, when not slipping or skidding, there were few other signs that this was, in fact, an open cockpit, as I climbed to 3,000ft and leveled off.

Flown carefully, one up, and with 30 litres of fuel, the X-Air582 gave me a 53KIAS cruise at 5,000RPM. However, this quickly dropped back to around 48KIAS if I used the ailerons to keep the wings level without balancing the incurred adverse yaw. The ailerons felt heavy;

I was surprised at the energy necessary to use them. In contrast, the elevator was light, so much so that it would be easy to over-control this aeroplane in pitch. The rudder was also light but not as powerful as the elevator. Considered all controls together, their harmony was only average at best.

For a high-winged ultralight, the visibility in turns was normal. This is a high drag/low inertia aeroplane and I noticed a drop in speed in 45° banked turns, both left and right. The light elevator forces made it easy to hold the attitude to maintain height but, being so light, the spectre of over-control arose again.

Stalls were a non-event. There being no flaps to play with, only basic and power on stall configurations apply. Basic stalls displayed little warning – just a nose sag with the ASI needle flickering at a little under 30kts. With power on, the rate of airspeed decay was naturally slower and the nose higher at the break until, maintaining 4,000RPM, the aircraft just sat there nose high and sinking. The flickering ASI needle was impossible to read accurately. There was no tendency to fall off either way, provided I used the rudder to prevent any yaw. The effect was to be nose high and steadily heading groundwards at about 240fpm. I only wondered how it might perform if I didn't stop the yaw?



AIRCRAFT FEATURE



“I was surprised at the energy necessary to use the ailerons”





AIRCRAFT FEATURE



“From the flare point to where I turned off was only 40m”



Turning towards the field I tried a 40KIAS glide. At this airspeed the VSI indicated 680fpm down, which is a little more than the book value for this configuration. Naturally, the controls were lighter but without the slipstream, the rudder was markedly less effective and much more pedal was required to yaw the nose. To explore the level of inherent stability, I stretched my left arm out into the airflow. Initially nothing changed but then, slowly, slowly, the nose drifted left and the left wing sagged in a gentle bank before the nose fell gently away. I pulled my arm in but the nose strayed even further left. Slowly the bank angle increased and the nose pitched further down. We were spirally unstable - all perfectly normal.

Back in the circuit, after the downwind call, the pre-landing checks were simple. There was no park brake, just one fuel tank and that didn't even have a fuel on/off valve. My harness was still tight and the aeroplane had no hatches.

When my flare point was just aft of the rear strut, a good lookout confirmed I was still alone in the circuit and I turned onto base, closing the throttle in the turn. With a planned approach speed of 50KIAS, I didn't want anything catching me from behind on finals. Keeping the flare point at an angle of 45° below the horizon, I turned final with the IAS nailed and the approach looked fine. The descent was rapid. This aeroplane, with an L/D of around 7:1 really likes to descend and could easily chase a crowbar down. I continued with the glide and

flared early but gently to allow for the steep approach. There was little float, the drag saw to that, and the aeroplane settled softly onto the grass without even a bump. The coil-sprung undercarriage worked well. As the airspeed fell, the nose-wheel settled and nosewheel steering was available. Again it was surprisingly heavy and required substantial leg muscle to maintain directional control. I opened the throttle and carried out a simulated overshoot.

We were airborne in about 10 (yes - 10) metres and I had to pull the nose up quite quickly to maintain 45KTS climb speed.

Even without flap the X-Air lands pretty short, so I decided to check out a precision approach and put it on a spot. Then I could see exactly how much room I needed to land. So I turned final, with 45KIAS this time, all trimmed with just enough power to pull me over the fence and onto the bare patch on the runway threshold. As I flared I pulled the power and with little float we settled, nosewheel high, onto the patch. Holding full back stick I used brakes to pull the nose down and stop as quickly as possible. At a walking pace I turned off the runway and looked over my shoulder. From the flare point to where I turned off the distance was only around 40m. This is short by any fixed-wing standards.

The aeroplane felt noisy, even though I was wearing a headset, but it is an open cockpit after all. For a 65HP 2-stroke, its performance is good and handling is fair. Its glide angle is steep, even without sideslip, but I did enjoy the wind blowing through the open cockpit.

The X-Air582 is a development of the Weedhopper, designed in the 1970s by John Choita. After further refinement in France, it is currently built in India by Raj Hamsa in Bangalore, and sold as a kit by X-Air Australia. The book says the airframe is stressed to +6 and -4g and the undercarriage to +9g. Its MCTOW is listed as 544kg.

For further details, www.xair.com.au ✪

National Safety Month

NATIONAL SAFETY MONTH

BY KATIE JENKINS
SAFETY, RISK AND
COMPLIANCE MANAGER

NATIONAL Safety Month is aligned with the CASA Human Factor initiatives released in July 2015. By identifying the significant safety-related trends and risk factors within recreational aviation, RAAus is working solidly toward developing safety related communication and educational material for members. Over the past six years, there have been 51 fatal accidents in RAAus aircraft; our investigations and analysis has determined 87% of these were the result of human factors or poor pilot decision making. So the question has been: how can RAAus as an organisation, prevent these accidents from recurring?

A cultural change is required.

A change in behaviour, mates looking out for each other, pilots feeling confident enough to discuss their mistakes openly so the lessons they learned can be passed on to others. Hangar talk is highly effective communication. How we achieve this cultural change is the tough question but, with a number of planned strategies, we believe over time we will begin to see change.

The planning process for the month has already commenced with some of the following safety promotions to be produced:

- Clear Mind, Clear Prop Safety Initiative Booklet with all Sport Pilot magazine subscriptions. You can view last year's safety insert on the RAAus website by following the link. <http://tinyurl.com/z6pfc9u>

- Themed hangar talk presentations being developed for our CFIs to deliver. They focus on safety-related trends.

- A series of safety videos to be made available by the RAAus YouTube channel.

For a taste of what's to come, check out a video we recently presented at the Sport Aviation Forum. <http://tinyurl.com/js5qlhv>

- A Safety Summit to occur during the October AGM in South Australia (which will also be broadcast online).

- Safety promotional items.

- The rollout of a Knowledge Bank on the RAAus website which will contain safety-focused factsheets and FAQs.

At RAAus, your safety is our priority and for the month of October we aim to continue the discussion. ☒





CLEAR MIND
CLEAR PROP



WHY ARE WE DOING IT ALL OVER AGAIN?

IN October 2015, RAAus launched National Safety Month with the aim of raising awareness of human factors in relation to safety related incidents within the membership. The objective was to reopen dialogue and refocus members on the need to consider the role human factors play in decision making and the physiological effects of flying an aircraft.

While the campaign served as a timely reminder for people to consider the effects of human factors in aviation, a year later the issue remains a relevant one in the industry. As well, due to the scope of human factors (which includes managing fatigue and stress, decision making, situational awareness and communication) there are a multitude of recurring factors associated with aviation incidents, particularly those associated with recreational pilots and RAAus registered aircraft.

After completing an analysis of recent and historical occurrences, the RAAus Safety team was able to conclude there were also seasonal factors relating to accidents and serious incidents, especially during the warmer months. The evidence suggests these factors—attributed to favourable flying conditions for VMC

aircraft— indicated conversations about safety promotions with members were best highlighted during warmer weather. It was for this reason October was selected to be the focal point of the safety promotions campaign. RAAus also recognises the importance of a regular conversation about safety so while October is becoming an annual focus, key messages will be shared every three months. RAAus is committed to keeping this conversation going and we look forward to members sharing their stories with us.

National Safety Month last year did have an impact. Human factors-related incidents have been down since.

This year, by reopening and encouraging further communication channels and by fostering a forum in which such conversations can develop, we again hope to see those improvements continue. By encouraging pilots and maintenance personnel to tell everyone about human factors-related occurrences, National Safety Month will improve awareness and consideration of topics often forgotten after the early stages of a pilot's training.

It confirms and reinforces RAAus' culture of open and fair reporting. ☺

“Hangar talk is highly effective communication”

National Safety Month

HANGAR TALKS

DURING National Safety Month last year, our key areas of focus were fuel starvation, flying below appropriate levels and providing general safety tips for pilots. Since then, we've implemented our occurrence management system which has allowed us to collect data and extract trends about where our incidents most commonly occur and what causes them.

As the reporting improves, and the organisation's ability to analyse data using the Occurrence Management System continues, RAAus will be able to identify the key areas which require a targeted approach.

As a result of this approach, this year's Hangar Talk Presentation topics focus on:

- Runway Loss of Control (R-LOC)
- Normalisation of Deviance
- Weight and Balance

In 2015 - 2016, more than one-in-five of the reports lodged in the RAAus OMS were those whose outcome was attributed to Runway Loss of Control during either take-off or landing. The identification of this trend using our Occurrence Management System highlighted the necessity of raising awareness of its causes and contributing factors.

NORMALISATION OF DEVIANCE

Another trend identified through the OMS, was the normalisation of deviance – when unacceptable practices gradually become acceptable and commonplace. The focus on this topic serves to highlight the importance of adhering to standards and procedures, even if a pilot has been able to cut corners without con-

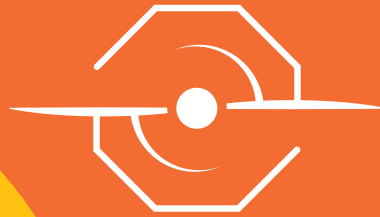
sequences in the past. An example is when a pilot doesn't bother to use a checklist for take-off or landing. It can, for example, lead to errors and mismanagement, such as forgetting to select the correct fuel tank.

WEIGHT AND BALANCE

Because recreational aircraft are only two seaters (or in some cases, one), many RAAus pilots tend to underestimate the importance of proper weight and balance calculations and loading practices for their aircraft. The topic of weight and balance has been included in this year's safety month agenda to highlight the importance of ensuring the weight and balance of an aircraft is correct for every flight.

You can read more about these safety topics and plenty more in this year's Safety Insert, 'Clear Mind, Clear Prop', mailed out to every member and available on the RAAus website. ✕





CLEAR MIND CLEAR PROP

SAFETY SUMMIT

DURING preparations for this year's National Safety Month, the Safety team was considering how we could get our safety messages out to as many members as possible. We already had hangar talks which were growing in popularity and proving to be very successful. We also were busy keeping up with the demand for the presentations, which have been made available to CFIs and other members as part of the members' portal.

But we still needed to fill in gaps for members who wouldn't be able to attend a hangar talk but still wanted to engage with us.

To fill the gap this year, RAAus will host a Safety Summit in October to bring together a series of fresh presentations by RAAus staff, all targeting safety awareness.

The Safety Summit will begin at 2pm, before the AGM (due to begin at 4pm). A key component will be that it will be interactive - members will be able to view a live stream of the presentations, ask questions and receive answers in real time.

Access the live stream of both the Safety Summit and AGM by logging in to the member's portal on the website.

Key safety messages will also form part of our presence at Oz-Kosh at Narromine this year. Check out the Oz-Kosh website: www.ozkosh.com.au for a full list of the seminars. ✖

SAFETY COMPETITION

AS part of this year's focus on starting the conversation about safety, we'd like to hear more about your stories.

Over the next few weeks, take a few moments to think about an incident, a near miss, or any sort of occurrence where you learned a lesson about being a pilot. Something you think other pilots would benefit from by hearing about.

As an incentive, we have some great prizes to give away including RAAus memberships, 12 month subscriptions to *Sport Pilot*, \$250 in flying lessons at the RAAus School of your choice and RAAus merchandise packs.

To be in the running, simply tell us about your occurrence in a way that we can share your story with other members. Be sure to include the lessons you took from it. Send your entry to safety@raa.asn.au.

Your contribution may also be used during future safety and training campaigns and be included in *Sport Pilot* and on the website.

Entries close at AET 5:00pm October 31. ✖

“members will be able to view a live stream of the presentations”



National Safety Month

HOW TO PREPARE YOUR BEACON BEFORE FLYING



Australian Government
Australian Maritime Safety Authority

1 Register your beacon and keep your details up to date

AMSA has recently improved the online beacon registration system to make it more mobile friendly and accessible for registering and updating your beacon information from your mobile, tablet or laptop.

Make sure your details are up to date in your online beacon registration account. This includes your contact details and emergency contacts. You can also now upload details about your trip plans and photos of your aircraft to help identify you in an emergency.

Having a registered beacon could make all the difference in a life threatening situation.

2 Check your battery expiry date

Regularly check your battery expiry date and test your beacon as per the manufacturers' instructions. Note that even if the light operates when you are testing your beacon after the battery expiry date, this does not guarantee your beacon will work correctly in a distress situation. So make sure you service and replace the battery before it expires.

3 Store your beacon correctly

Although ELTs are mounted in a rack and installed permanently in an aircraft, PLBs should be kept on your person and within easy reach in case of an emergency. Be sure to keep it away from items that might accidentally knock the activation switch.

4 Test your beacon correctly

Test your beacon on 'test mode' and not by switching it on and off in the operation mode. This will transmit a 121.5MHz homing frequency, which can be heard by overhead aircraft that will be reported to AMSA.

amsa.gov.au/beacons

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Photo shows some options

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CLEAR MIND CLEAR PROP

HANGAR TALK PRESENTATIONS

IS there an event in your area? Many RAAus schools have jumped on board the National Safety Month runway this year and organised plenty of events around the country for pilots to attend. By the time you receive this magazine, there will no doubt be plenty more. Information is available if you'd like to organise your own hangar talk available. Visit the RAAus website to stay up to date with event details and to find out about what's on in your area.

And, as a big incentive, people who attend a hangar talk get the chance to win a 12 month RAAus membership. There are two memberships being given away at every event.

Is your school participating? If not, get them involved.

Current listings (As of September 8)

NSW/ACT

Airwings Flight Centre, Narrandera

Wings out West, Dubbo

VIC

Yarrowonga Flight Training, Yarrowonga

Learn to Fly Melbourne, Moorabbin

Blue Sky Flight Training, Morwell

Sunraysia Flying School, Mildura

Valley Lite Flite, Traralgon

Sarge's Light Sport Aviation, Bendigo

WA

Busselton Aero Club, Busselton

Kelmac Aviation, Geraldton

Howatharra, Serpentine

Topfun Aviation, Bindoon

NT

No events listed for Northern Territory yet

QLD

Lone Eagle Flying School, Clifton

Coominya Flight Training, Coominya

Burnett Flyers Club, Murgon

TAS

No events listed for Tasmania yet



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For a more up-to-date event listing, visit the RAAus website. ☺

Building an EFIS for \$130

BY OLEG DESHIN



WHY build DIY avionics? To save money on non-mission critical components of your aircraft; to build backup and primary instruments; to learn about avionics or just to have fun.

The idea is to build a backup (or primary?) EFIS for a light experimental aircraft for a fraction of the cost of functionally similar Dynon, GRT or Garmin unit. It turns out that it is not as hard as it might seem.

The main focus of the project design is to make it easily repeatable. It's built of pre-assembled components, so you only need some basic soldering skills to put it together. The project's components are widely available from eBay or from your local DIY electronics store.

There is a large community of people in the world experimenting in robotics. They all use the same components and support each other in creating reliable and efficient designs. The project is designed in a way which makes it easy to be replicated with basic tools, a computer, a soldering iron and a \$10 multimeter.

THE EFIS

The EFIS includes ASI, ALT, VSI, magnetic compass, slip indicator (ball), attitude indicator (artificial horizon), flight-time timer, UTC/local time and G-meter. QNH and other instrument settings are done via 'push-turn' knob (encoder), just like on Dynon or Garmin EFIS. Version 1.1 includes flight parameters recorder (a sort of black box) on an SD card.

CPU BOARD

The system is built around Arduino Mega 2560 board. At this stage, I'm using a non-genuine 12MHz model. It works just as well as the genuine 16MHz model, but it's a lot cheaper. I think any other Arduino board would be suitable for the project. The board has on-board voltage regulators to supply power for itself and other components, both 5v and 3.3v. The input power could be in the range of 6 and 20v. With a 9v power supply, the system consumes around 125mA.



EFIS components

DISPLAY

When I started I was thinking of using a colour display. As it turns out, good sunlight-readable colour displays are very expensive and require significant processing resources. So, after some research, I settled on a 4" 192x64 pix KS0107/KS0108 based monochrome display from Buy-Display for \$30 USD. The display has a nice white back-light and looks fantastic under direct sunlight. The display has a resolution of 192x64 pixels and is about 4" diagonal. It is big enough to display all important flight information.

GYRO

For a gyro I chose a new BNO-055 sensor from Bosh. It seems to be superior to other popular solid state gyros, mainly because it has internal processor calculating Euler vectors including magnetic heading. It is quite expensive though, and it's most expensive component of the EFIS (so far).

ALTIMETER

I tested BMP-085, BMP-185, BMP-285 and MS5611 sensors and found that MS5611 (aka GY-63) is quite a bit better than the BMP-x85 series. The problem with all these sensors is that they are mounted on the PCB board. There is no nipple to attach a plastic tube to them. I had to build an air-tight enclosure for them so it could be connected to the static port of the airplane. I have built one and it is okayish for testing the system, but I think I'll have to replace it with some other factory-built sensor that has a nipple, something like Honeywell SSCSRN-N015PA3A3 or MS4525DO-SS5AI015AP.

AIRSPPEED SENSOR

I used a MPXV5010DP analog differential pres-

sure sensor which should be good for airspeeds up to about 250kts. For slower (below 112kts) aircraft the MPXV7002DP sensor can be used – it is a bit cheaper. I will probably replace the analog sensor with the digital one (I2C), something like Honeywell HSCDDR001PD2A3 or MS4525DO-DS5AI001DP. It might add about \$40 to the total cost of the project.

CLOCK

A board with a DS3231 chip and a rather large replaceable CR2032 battery used as a real-time clock. The battery should last for two-three years.

All the components mentioned above come attached to their PCB boards with all the required circuitry. So all that needs to be done to get the device going is to attach the boards together and upload the software. While testing the design, I used a simple evaluation board. Once the design is stable I'll make a proper PCB board interconnecting all these tiny sensor boards.

Jamming all of this stuff into the plastic case is the biggest challenge. The display is attached to a large PCB, so the case looks a bit too large for the size of the screen. Anyway, it all fits into the case nicely and it's ready for testing... at zero ft AGL on top of my car's dashboard.

TEST PLAN:

- Airspeed accuracy
- Altitude accuracy
- Magnetic compass
- Hot conditions
- Effects of vibration
- Artificial horizon accuracy (will not try inverted flight in the car).

Stay tuned for my progress. ☺

A NOTE ON BOLTS

Darren's article on bolts (*Sport Pilot* Tech Talk September 2016) needs a couple of minor clarifications.

There are no dash 8 bolts, they go from dash 7 to dash 10. Also, the bolt size used as an example was half an inch long, so it would be

dash 4 not dash 8 as stated.

AN4-8A

• AN means the bolt is manufactured according to Air Force-Navy specs;

• '4' identifies the diameter of the bolt shank in 1/16" increments;

• '8' identifies the length of the shank in 1/8" increments;

• 'A' means the shank of the bolt is undrilled (no letter here means a drilled shank).

So, this particular bolt is a 1/4 inch diameter AN bolt that is 1/2 inch long.

FLY-IN TO DIA

BY STEVE ALLEN

On departure -
cleared to track
via the city

PITCH Black 2016 was an intense, multi-national air combat exercise, staged in and around the top end of the Northern Territory over three weeks from late July. It involved the Air Forces of many countries, including Singapore, Thailand, the US Marine Corps, the US Air Force, Indonesia, France, Canada and nine Australian squadrons. Besides the fighters, of which there were many, the exercises included refuelling tankers, heavy transports and AWACs.

When it was over, as a thank-you to the people of Darwin (mainly for putting up with

the noise of full-scale fighter operations day and night) the military staged a Pitch Black Open Day at Darwin Airport. The airport is primarily an Air Force Base with military Air Traffic Control. As well as its International Airport function, it also sees a lot of smaller RPT and charter operations, mainly to the remote communities in the Northern Territory.

Into this heavy mix flew nine aircraft from the Top End Flying Club to put our eight RPAus and one ASRA aircraft on static display.

We obtained approval from ATC and an instrument from CASA for the exercise. Our mixed gaggle was made up of three Drifters,

“A mixed
gaggle”



Exposed engine created more discussion



Waiting to call for taxi clearance



LNG plant under construction



“Swamped by visitors”

three Jabirus, a Lightwing, a trike and a gyroplane. The main runway is 60m wide (wider than Sydney runways), over 3.3kms long and includes arrestor wires for military aircraft, if needed (we didn't need them). Even the white centre-line is a metre wide.

After a successful arrival, we taxied to our assigned display area and set up.

The remainder of the day was taken up with being swamped by visitors, keen to check out our aircraft. I had queues of people on both side of my Jabiru, waiting to take a turn to sit in the plane, and others were just as busy. I must have had 150 kids sit

in the plane, plus lots of adults. I took off the engine cover to disconnect the starter solenoid, just in case some kid managed to switch on the Master and hit the starter button. Talk about potential for disaster and then the trouble of having to clean up the blood!

As soon as the engine cover was off, I was inundated with guys interested in the engine, so I left the cover off and spent a lot of time talking engines, while my passenger ushered kids and adults into and out of the seats for photos.

The military aircraft were also on static





Drifter interest



Taxi - number 2 to the Wedgetail



Queues on both sides to get in



display, but mostly cordoned off for viewing from the ground. I think the appeal of the recreation sector was that it was a real hands-on experience for everyone. As I had said to people, "When you have seen the military aircraft, then come over to us and look at the real aeroplanes". That seemed to be fairly accurate description of what everyone did.

To top it all off, when we departed we left from runway 29 with instructions to turn left and track via the city – great views and photo opportunities.

This was not the first time we have flown into Darwin with approval from ATC and CASA – it has happened pretty much every year for years, but it is always a buzz for us light types. ☺

A good read on a cold day

BY THE OPS TEAM

Everyone knows the requirements for pre-flight planning before you head off for that big trip around Australia. But what about local flying? Do you really need to use the same principles if you plan only to fly around your local aerodrome? Do you really need to check the NOTAMs every day when nothing ever seems to change? Yes, you do.

CONDITIONS and requirements can change, even for local flying, or for that regular weekly visit to the other local aerodrome to catch up with mates.

Factors such as weather, including the recent high rainfall experienced across much of the country, changes in frequencies, works at the aerodrome and maintenance issues with the fuel bowser, the increased risk of bird strike at particular times of the year or other conditions can all result in new and unexpected NOTAMs.

Recent examples from my home aerodrome include a warning about not using the grassed areas due to rain (expected) but also a warning not to use runways 09/27 or 05/23 (definitely unexpected). I could have predicted the gravel 09/27 might have been affected by the rain, but not the relatively new two kilometre 05/23. Yet, there it was. Both of these runways unusable at the same time, leaving only 18/36 for aircraft to use.

And an unexpected NOTAM may not just be associated with your aerodrome either. It could be mentioned somewhere else in the list. In a recent NOTAM it mentioned there were model jet aircraft operating within 12nm of Narrandera. The NOTAM said the model jets would clear the airspace if required to allow aircraft to land. Important to know if flying into Narrandera, but the information was not in the briefing section for Narrandera but in the Head Office section. To obtain the information you had to read a lot of non-relevant information, under Head Office NOTAMs in the area forecast, but this it was certainly information you needed.

At Cobar, they have recently introduced landing fees, made the aerodrome a security controlled aerodrome and added an Av-gas self-service bowser. This may indicate a new passenger jet service has begun, another issue to be aware of if you plan to travel there, even just for a local flight. This information was provided initially as a NOTAM, which means it will end up in the En-Route Supplement Australia (ERSA) on

the next amendment cycle.

Most pilots have some sort of flight planning software on an electronic device, and the programmers of most of this software make it possible to easily obtain weather and NOTAM info, so there really isn't any excuse for not at least glancing over the information - even for a local jolly around the area. The ERSA in its entirety can also be downloaded on these devices, but it means you need to keep it up to date.

We used to hear pilots complain about the cost of keeping their charts and ERSA up to date, but now your annual subscription to the flight planning software allows you to keep all your charts and information current at the push of a button, so there is no excuse.

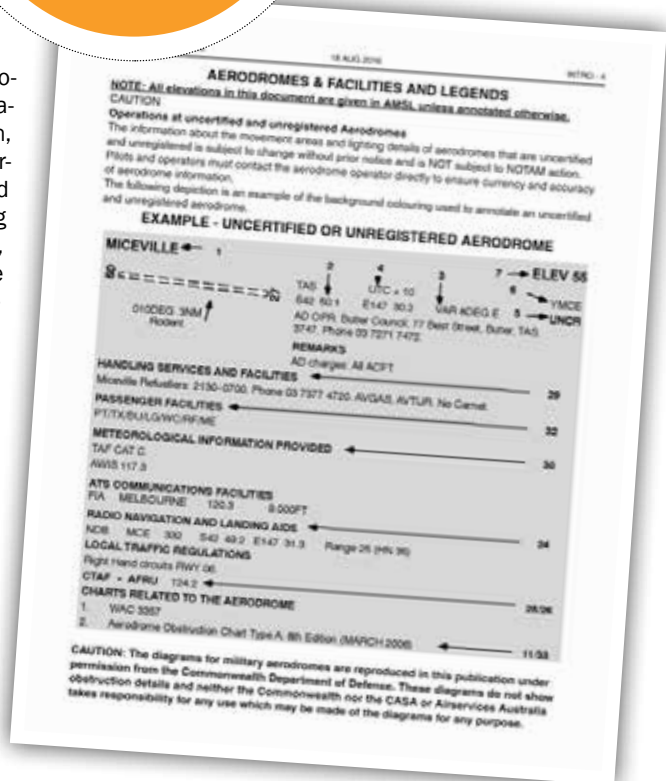
A quick perusal of ERSA provides some interesting information too. In the Introduction, there's a range of useful information, including website and phone numbers for everything from NAIPS for flight planning, to the contact numbers for the Search and Rescue Centre, the ATSB and FlightWatch.

The next page provides explanations of the types of information available for aerodromes, why you won't find NOTAMs for ALAs, how to advise of errors and more. After that a detailed explanation is provided on how to interpret the information provided in a typical aerodrome entry. While not all of this information is relevant for our category of flying, there are useful gems hidden away in this information, including

an explanation of abbreviations such as H24: continuous, HJ: Sunrise to Sunset, JF: Saturday, Sunday and public holidays and PPR: Prior permission required. PPR is an important requirement to know about, because aerodrome operators who have this requirement usually have operational reasons for requiring permission prior to landing, and they may submit a complaint if you land without permission.

There is also information about how to activate Pilot Activated Lighting (PAL) using sequenced transmission on the radio and the Aerodrome Frequency Response Unit (AFRU), which provides confirmation of the location at which the broadcast

“Hands up anyone who has never read this section?”





was received and indicates how long ago a broadcast was made. While Certified Air/Ground Radio Services (CA/GRS) are not common, there is useful information about this service as well. Of major importance to pilots is the information provided about fuel type, availability and the passenger facilities available, including toilets, taxis and accommodation. As we move towards the day when RAAus pilots operate aircraft with increased MTOW, the runway distances available at the aerodrome will become more important. And all of this information is contained in the first 24 pages of the ERSA Introduction. Hands up anyone who has never read this section?

At the back of ERSA are emergency procedures including advice on transponder codes for emergencies - 7700 - and radio failure - 7600. Suggested phraseologies for Mayday and Pan calls are provided, recommended procedures for transmitting blind (not sure you are receiving radio transmissions), light signals at towers (if CTA access is eventually approved for RAAus pilots, this will be required information. It is still used in the event of radio failures). Vitally important information is provided about the activation of Emergency Location Transmitters (ELT), or Personal Locator Beacons (PLB), how to maximise the signal this equipment broadcasts and what search patterns aircraft engaged in search and rescue operations will use. There are recommended codes for signalling information to aircraft and important first aid information. Advice about surviving in the desert, jungle and cold weather environments or at sea, along with how to find water. Again 27 pages of really useful information and I suspect you will not want to read it for the first time when you are stranded.

There are still enough rainy days left in the year to spend a couple of hours reading these pages and becoming familiar with the terrific information available in the ERSA. ☺



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Stick With It

DESIGNING YOUR OWN AIRCRAFT BY DAVE DANIEL

Schematic Representation of a Bonded Double-Lap Joint

(Adhesive thickness exaggerated for clarity)

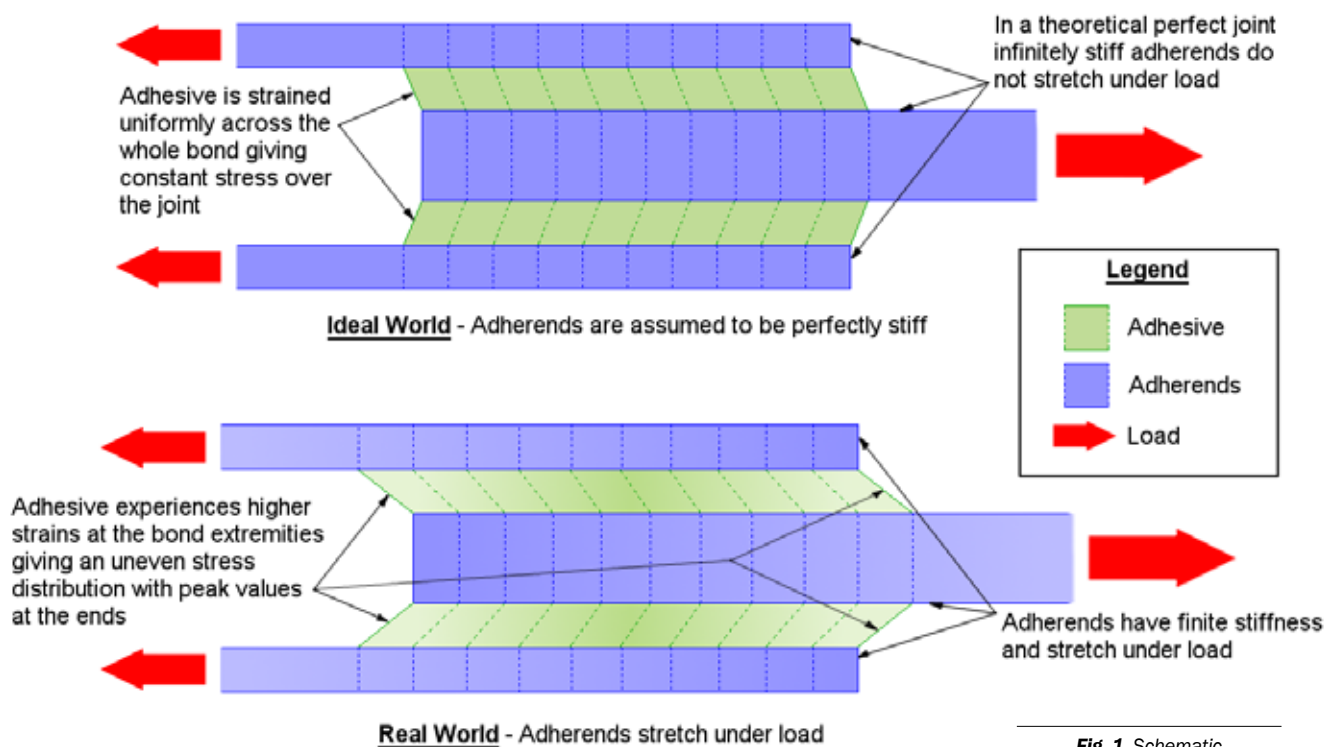


Fig. 1 Schematic representation of a Bonded Double-Lap Joint

LAST month we had a look at joints and the importance of their configuration to their durability and strength. I endeavoured to cover some more general problems of joint design and find some golden rules which apply almost universally. However, it takes no great stretch of the imagination to realise that optimum joint design is heavily dependent on the fastening system used. Visualise a metal airframe where all the rivets have been replaced with bolts and the importance of selecting the correct fastening system for the job should be immediately apparent.

I can't hope to cover the subject comprehensively, but over the next few months I'm going to delve into some of the specific quirks associated with different methods of fastening and hopefully provide some insight into the pros and cons of different fixing methods, starting this month with bonded joints.

A STICKY SITUATION

Adhesively bonded joints have been around for a long time, but they have a rather patchy track record in aircraft. Many early models suffered from durability issues thanks to the primitive casein adhesives available at the time. Casein, from the Latin caseus meaning cheese, is derived from milk and when exposed to warm, moist conditions has an alarming tendency to be devoured by micro-organisms - with predictable results. The situation had improved somewhat by the mid 1940s

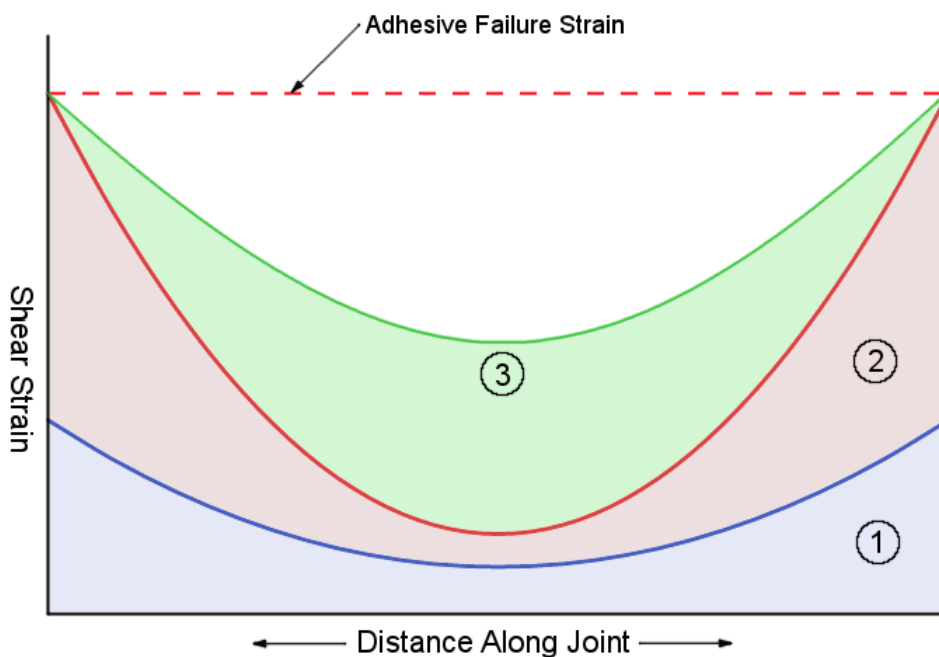
with the introduction of resorcinols. Resorcinol glues are resistant to both water and UV, making them better suited for aircraft, especially in the tropics, but they have poor gap filling properties and so require tight fitting joints and high clamping pressures. Despite these drawbacks, resorcinols were a clear improvement on what was previously available and achieved broad acceptance, being widely used in aircraft until the arrival of commercial epoxies and other adhesives in the 1990s. Modern synthetic adhesives have now all but eradicated the problems associated with their predecessors making strong, durable and reliable bonded joints a common feature in modern aircraft and providing engineering performance which is frankly not far short of a scientific marvel.

Modern adhesives look like an ideal solution to all our joining needs, so why don't we just abandon mechanical fastenings and simply glue everything together? Let's ignore the obvious answer - sometimes we actually need to take things apart again after we have built them - and examine what sets adhesive bonded joints apart from conventional mechanical fastenings.

Adhesives distribute loads over the area of the joint, minimising concentrated stresses. This is especially attractive for joining the thin sheet materials frequently encountered in aircraft structures, and even more so for composite structures which don't tolerate concentrated loads well. Fasteners, on the other hand, concentrate loads around the attachment points, often requiring local reinforcement or thicker materi-



Strain Distribution in a Bonded Joint



- 1 At lower loads adherends stretch less distributing the load more evenly over the joint. Low stress area in centre of joint protects against creep
- 2 As the loading increases the adherends stretch loading up the ends of the joint. The joint will start to fail with the adhesive in the centre of the joint at low stress
- 3 Stiffer adherends or more flexible adhesives allow the strain to distribute more evenly, flattening the shape of the curve. The overall strength of the bond is equivalent to the area under the curve so this gives a stronger joint.

Fig. 2 Strain distribution in a Bonded Joint

als in these areas which increases weight. It can also be argued purely bonded joints require less labour, fewer parts and are quicker to apply (after all you don't need to drill hundreds of holes and apply hundreds of fiddly and heavy fasteners), but the truth is it's not quite so clear cut, as we shall see.

So if bonded joints are light, efficient and practical, why on earth would we want to use any other joining technique? Well there are some drawbacks. In brief: non-uniform stress distribution, creep, peel stresses and quality/reliability/inspectability. Let's have a look at them and see how they are treated.

STRESSED OUT

Given that I just pointed out one of the principal benefits of a glued joint is its ability to distribute loading over a large area, you might be surprised to discover that non-uniform stress distribution is a problem for bonded joints. In fact, in an ideal world with perfectly stiff, (i.e. non-extensible) adherends it wouldn't be a problem at all. As you can see from Fig. 1, if the adherends - which, by the way, is just a fancy engineering term for something which is glued to something else using adhesive - don't stretch, the strain is shared out evenly over the entire bond area. Unfortunately this isn't an ideal world and we have to deal with ma-

“Why would we want to use any other joining technique?”

terials which stretch under load, as shown in the bottom half of Fig. 1. This stretching causes the edges of the bond to strain more than the middle portion and so experience considerably higher stresses. Worse, if the joint is loaded to the point that the adhesive at the edge fails, the rupture simply increases the loading on the rest of the joint and causes that to fail in quick succession as well. In other words, the 'lazy' glue in the middle of the joint provides precious little extra strength.

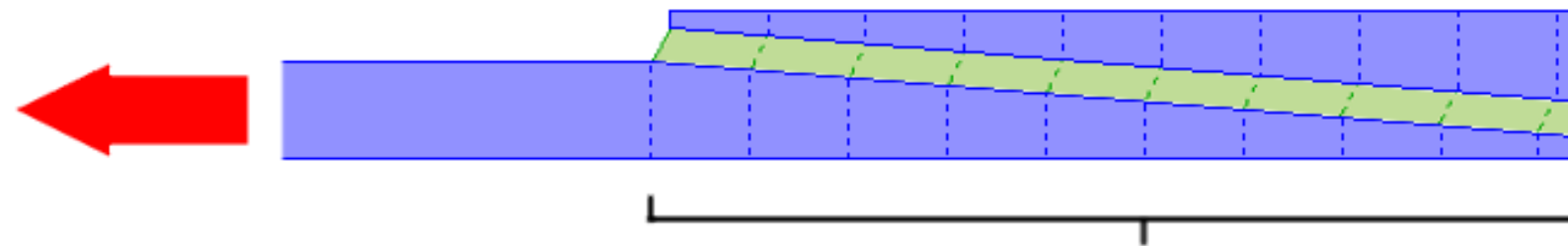
This has a couple of implications: Firstly, if you want to make a joint stronger, increasing the overlap is not the way to go about it - that simply increases the quantity of 'lazy' adhesive. By far the best way to increase the strength of a joint is to make it 'wider' so the highly stressed edges, which carry the bulk of the load, extend over a larger area. Secondly, as illustrated in Fig. 2, to maximise joint strength you really want your adhesive to be more flexible than the adherends it's gluing. This helps distribute the load more uniformly over the joint, maximising its load carrying capacity. Uniform load distribution also explains why scarf joints (shown in Fig. 3) and stepped-lap joints work so well. By tapering the adherends, their stiffness is tailored to match the load, keeping the strain of the adherends approximately equal on both sides of the joint and more evenly distributing the strain in the adhesive.

Stick With It

DESIGNING YOUR OWN AIRCRAFT BY DAVE DANIEL

Schematic Representation of a Scarf Joint

(Adhesive thickness exaggerated for clarity)



Adherend thickness decreases as load is transferred into adhesive reducing stiffness and giving almost constant strain along the bond line

Fig. 3 Schematic representation of a Scarf Joint

CREEPY

Now from the above description you could be forgiven for thinking the bulk of the adhesive in the middle of a joint isn't doing much. In fact, we should make the overlap as small as possible; eliminating unnecessary material and saving weight. But going for the narrowest possible overlap may not actually be the best idea. All materials suffer from creep to some extent - that is they slowly stretch over time under continuously applied loads; even loads way below their failure strength. For metals, creep is seldom a problem because they virtually all exhibit negligible creep at ambient temperatures - it's only when things start to get hot that creep becomes a problem, which explains the high-tech and eye-wateringly expensive metallurgy involved in producing jet turbine blades. However, for adhesives, and indeed many polymers, low temperature creep is a real problem, and this is where the 'lazy' adhesive in the middle of our bonded joint comes into its own. Although the edges of the bond may be stressed enough to creep, the low stress area in the middle of the bond is not. It stays put, protecting the whole joint from a creep induced failure.

BOND VILLAIN

Structural adhesives generally have excellent strength in shear and good, albeit somewhat lower, strength in tension. Where adhesives typi-

cally struggle is peel strength. This explains why we peel off sticky tape; it's simply the best way to defeat an adhesive - applying all the loading along one edge instead of taking on the whole bond area at once. Peel is primarily avoided through good design, which explains the great efforts designers expend to ensure adhesive joints are primarily loaded in shear. Although unfortunately even the best designed shear joints manage to generate their own peel forces, usually as a result of the adherends deflecting under load thanks to eccentricity in load paths.

FEEL THE WIDTH

The final big problem with glued joints, especially for certified aircraft production, is reliability which actually boils down to quality and inspectability. It's easy for manufacturers to batch test rivets or bolts and certified fasteners can be trusted to deliver their specified performance. They also remain inspectable even after they have been installed - after all, you can see if a rivet has been bucked properly. But this isn't the case for a glued joint. Cured fibreglass is somewhat transparent, so with a bright light and a sharp eye you might be able to pick some bond line defects, but this benefit doesn't extend to carbon fibre or metal parts and there's really no way to confirm the quality of adhesion without actually attempting to break the part and risking weakening it in the process. Bonded joints are sensitive to surface preparation, contamination, temperature, humidity, mixing ratio, bond line thickness, post-



Strain is more evenly distributed in the adhesive giving a stronger joint

curing and even age and storage of the adhesive. Even with strict controls, there can be large differences between the strength of seemingly identical joints. This leads to a couple of outcomes, the first being larger factors-of-safety for bonded joints, requiring them to be overbuilt which adds weight. Secondly, especially for certified applications, what are commonly called 'chicken' fasteners appear – additional mechanical fasteners added over a bonded joint to protect against peel failures and provide a failsafe mechanism to meet certification requirements. You'll hardly need me to point out that adding fasteners to a glued joint is going to give up a great deal of the potential benefits at best.

AND FINALLY

Adhesives certainly have their place, and the lightweight, home-built end of the aeroplane market is where they excel. You'd be crazy to build a small wooden or composite aeroplane using anything other than glue for all but the most heavily loaded and critical joints. While bonded joints do have their weaknesses, careful design and maintenance can avoid the pitfalls, as is amply demonstrated by the thousands of strong, durable and reliable joints currently flying in aircraft all over the world. ☺

NEXT MONTH Bolts

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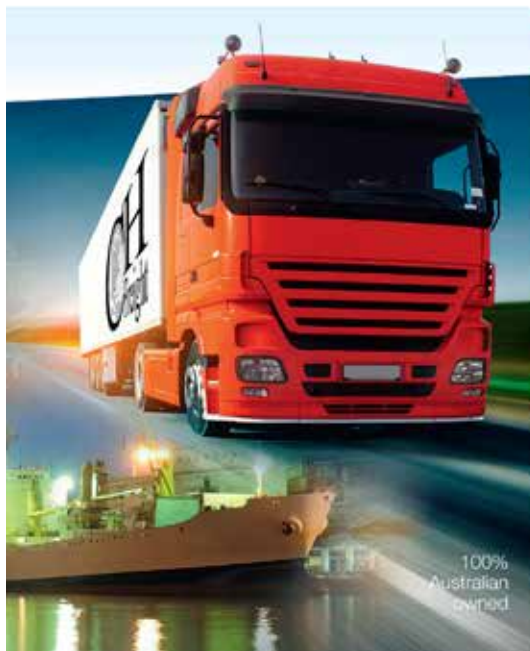
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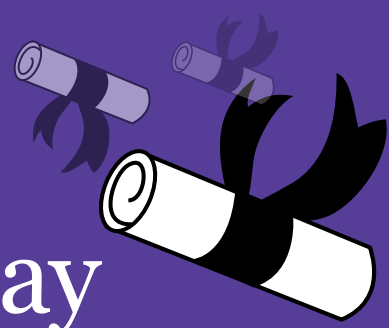
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Safety – all day every day

BY PROFESSOR AVIUS AVIATION GURU

THE worst of winter has passed and what a wet winter it has been. Especially in the south east of the country. Hopefully as spring progresses, we can enjoy much safe flying.

So I've risen to a clear morning and not much wind – and decided that I'd go flying to rid myself of those winter blues. But, as usual, I need to remember my safety checks. The first of which is find a mirror, have a good look at what I see and remember who has the first and last responsibility for my safety.

Again as usual, on each and every flight it is the pilot in command.

As a promotion it is appropriate RAAus has embarked on a National Safety Month again; but if October doesn't work in your particular environment, do it in November or December. But please do it. We had a great session at our flying school last year. As CFIs and instructors we are the mentors and should be encouraged to conduct safety forums in the form of Hangar Talk presentations in our respective areas of operation - and not just during Safety Month. If the potential audience is small, consider combining with an adjacent flying school or flying club – perhaps even program it as a mini-flyaway.

The RAAus Safety Team has pre-prepared presentations for your reference, but the safety message is never just limited to these topics. If you have identified something as a potential issue in your area, share it with the RAAus Safety Team. They may just have something in the way of a presentation for you on the subject.

The topics for Safety Month last year included: Fuel to go; Low flying; Flight planning and Weather.

Unfortunately, whatever the incident, it seems the statistics are dominated by Human Factors.

The focus topics for 2016 include: Runway Loss of Control, the Importance of Weight and Balance and Normalisation of Deviance.

Runway Loss of Control is, in its raw form, mostly self-explanatory, although the outcomes may vary considerably.

Weight and Balance is something covered in the theory when you gained your Pilot's Certificate – often it's not revisited until your time to do your BFR, but it is also not well understood by some instructors.

But the outlier is Normalisation of Deviance, something not specifically included in training. Therefore Safety Month is timely in raising this topic.

Normalisation/Deviance: It may seem to be an odd term. But the term, and the premise behind the term, provides a valuable explanation as to some of the behaviours you see in the first response world, somewhat a follow on to Situational Awareness.

Normalisation - To make normal; to make an established standard.

Once we have rationalised our need to take shortcuts often enough, reinforced with positive or successful outcomes, the shortcut becomes the new standard of behaviour. It becomes the new normal. Once this happens on a large scale, no one within an organisation will see the shortcomings in the behaviour because it will seem normal.

Deviance - Departing from the norm; performing in a non-standardised way.

It is easy to get drawn into deviance in the first response world. We operate so often under conditions of stress, consequence, time compression and changing conditions that taking shortcuts to expedite successful outcomes can become, in itself, normal.

GOOD CALL, BAD CALL

A few weeks back, while the professor was operating away from his normal base, he heard an RAAus aircraft operating in the vicinity and frankly,

the radio calls of this pilot were not up to standard. The departure call did not include a time, track or intended cruise height. Later, the inbound call was no better: distance from airport only, no direction, no height, no ETA for the circuit. This airport was also serviced by a regional airline. While examples like this of poor radio procedure are not limited to RAAus pilots (some GA pilots could also sharpen up) it's something we need to pay particular attention to.

Hopefully, in the not too distant future, after lengthy input by the RAAus team, we will be able to access a Controlled Airspace endorsement.

So it is the duty of instructors to monitor and improve the performance of all pilots and through the BFR ensure that at all parts of a pilot's operation are up to standard – including radio procedures. If not, the hard earned privileges of all members to get CTA access may not last long.

SLOGANS

In the aviation world there are many acronyms and truisms. Student pilots come to be familiar with most of them. Here are a couple more for you.

- Shortcuts cut life short;
- Keep safety in mind. It will save your behind;
- If you mess up, 'fess up';
- It's easier to ask a dumb question than it is to fix a dumb mistake;
- Safety comes in a can - I can, you can, we can be safe.

If we live and sleep safety, we will be much better positioned to ensure a safe outcome from all situations. Make your presentations palatable to the entire audience; make sure that where possible everyone in the group is involved.

Finally: Remember, first and foremost I'm (me) responsible for my safety. And secondly, I'm responsible for your safety: if we adopt this philosophy, we have a much better chance of operating safely.

Finally, encourage all pilots (student and upwards) within your RAAus network to attend a Hangar Talk and fly safely into the future.

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Converting car engines

THE BEST BITS ABOUT BUILDING YOUR OWN BY DAVE EDMUNDS



William Wynne, the guru of Corvair engines for aircraft, is an engaging speaker. He opened his talk at Oshkosh this year by pointing out that, in the first 13 days of Corvair engine production in the early 1960s, Chevrolet exceeded Jabiru's entire engine production of 7,500 engines to date. Chevrolet then went on to produce the engine for the next nine years, producing a total of 1.8 million engines. However, William has put just 500 engines into aircraft.

OVER the years, many different car engines have been put into aircraft, most without structural problems. The list includes the Ford model A as well as various later Ford V6 and V8 engines. VW engines dominate the automobile conversion fleet, although later such engines have a lot of non-VW parts. Then there are various Subaru, Honda, GM, Suzuki, Porsche and Mercedes engines. The one I most like, because of the exquisite irony, is a scale Mustang P51 fitted with a BMW manufactured V12 Rolls Royce car engine.

Most of these converted engines have been produced in such small numbers, and with such idiosyncratic conversion engineering, that it is not possible to compare reliability with purpose-built aircraft engines. However, with the exception of some early VW conversions which were done very poorly, most of the conversions appear not to suffer from any basic engine-design related problems. That is, there does not seem to be a record of broken crankshafts, blown valves or pistons, the sort of problems which can indicate a basic incompatibility with aircraft use. Most problems which do occur seem to be related more to installation than engine design.

At Oshkosh, my attention was drawn to a Suzuki engine conversion. The conversion is produced by a company called Aeromomentum based in Florida. They use two different Suzuki M series engines, one of 1,300cc and the other of 1,500cc. The company manufactures its own gearbox to reduce engine speed to propeller speed.

Incidentally, perhaps the major problem in using car engines in planes is that the car engine is not designed to handle the gyroscopic force produced by a propeller. Direct drive engines require an additional large bearing to take the load. Engines with speed reduction devices have the bearing built in to them.

The 100Hp Suzuki is just 2kgs heavier than the 100Hp Rotax, but is much less than half the price. The larger 1,500cc engine sells for \$US9,995 or \$US11,995 depending on the installation. It weighs 2kgs

more than the Jabiru 3300 engine and around 10kgs less than the Lycoming Y10-233. The Suzuki produces 117Hp, which is about the same as these other engines. The Jabiru 3300 sells for \$US19,995 and the Lycoming for \$US21,500.

There are major design differences. The Suzuki is a modern inline liquid-cooled, overhead cam engine with sequential fuel injection, controlled by a modern engine computer. The other engines are traditional air-cooled devices with fixed ignition and carburetors.

Various versions of the Suzuki engine are produced for cars which output considerably more than the 117Hp in this conversion. Production turbo-charged versions produce 138Hp and there are hot-rod versions with huge boost producing up to 230Hp. So, the Suzuki engine is not highly stressed.

The big issue, as with all car engines conversions, is reliability. We know from the recent saga that the Jabiru engine is very sound. The Y10 233 Lycoming is relatively new on the market. It is a development of the O-235 which has been around for many years. However, not many have yet been produced, so it is not possible to know how good they are.

The Suzuki has been produced in the squillions. The company has developmental resources the aircraft engine companies can only dream about and a fleet performance history unparalleled in aircraft engine companies.

But the Suzuki does not have redundant systems. It relies on the electrical system to drive the high-pressure injector pump and ECU. These are potential points of failure. And yet, when did you last hear of a car engine failing because of a fouled spark, a collapsed coil or failed ECU? No doubt it does happen but I will wager the failure of aircraft engines just due to carburetor icing is a much greater potential problem. As the Suzuki has electronic fuel injection, it cannot suffer from carburetor icing. I have had an ignition module fail on my aircraft engine (detected on the ground during runup), but it has never happened in all my years of

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Car engines are not designed to handle gyroscopic force



Gearboxes

driving or riding motorcycles.

Of course, this is all anecdotal. We know engines of all sorts do fail, including aircraft engines. This will be a topic for next month. It is unlikely that, at least in the short term, there will be enough car engines converted to get a clear picture of their comparative reliability, and in particular whether there is some common point of failure.

The duty-cycle of engines used in aircraft is quite different from engines used in cars, so while the aircraft engine spends more time at the top end of its power band, it is not at all clear this is harder on the engine than creeping along in a traffic jam on a hot day.

Longevity is another interesting and unresolvable question. Typically, small aircraft engines have a TBO of around 1,500 hours. This may be very roughly equivalent to a car engine with around 100,000kms. Who ever heard of a modern car engine with that sort of mileage which was much more than run in? My wife hoons around in our old Falcon with the horse on the back - a fair load on the engine. Our mechanic says in the unlikely event the engine does not do 500,000kms, it will be cheap to replace because the wreckers have heaps of engines. Apparently the car falls apart around the engine which ticks along just fine.

And another thing. Some years ago Subaru was approached to sell new engines for use in aircraft. The story goes that Subaru did not want to

be associated with this project, and it is pretty obvious why that might be. The Aeromomentum Suzuki conversion uses all new engines, but in small quantities. It is a moot question as to whether Suzuki knows or cares. One thing is for sure, Suzuki will not put a stamp of approval on any such conversion. It has long been the practice of US car companies to sell 'crate' engines. These sell for sensible prices, and companies converting these engines for aviation use make no secret of the source of the engines. The Viking company, which produces a Honda engine conversion uses low-mileage engines.

Modern engines produced by the major car companies are astonishingly rugged. Generally a core engine is designed, and variants are created by boring it out, stroking it, turbocharging it or supercharging it. They really do not wear out, nor do they suffer from mechanical failures. A low-powered variant suggests an even more likely chance of reliability in an aviation environment. Because of the quantities produced, the development costs are amortised into the purchase price in a way that is simply not possible with aircraft engines.

It is a pity car companies are not interested in the legal complexity of being associated with aviation use of their engines, so widespread use of these engines remains a tantalising possibility, likely to be overtaken by electric engines before anyone works through the liability issues. ☹

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CAGIT handed on to Mark Mclaughlan (left) by Noel Thomas

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AeroKits	42	C & H Freight	56	PSB	16
Airborne	67	CASA	68	Recreational Flying Co Gympie	60
Alpine Aircraft	22	Coominya Flight Training	62	ROTEC	55
Asia Pacific Light Flying	14	D-MOTOR AUSTRALIA	62	SEQFTA	62
Atec Aircraft Sales - Zephyr	56	Foxbat Australia	20	Sling Aircraft Australia	8
Australian Aircraft Kits	58	Horsham Aviation	5, 60	Sport Aviation Tocumwal	62
Australian Commercial Credit	56, 62	Jabiru Aircraft	2	Starfox Aircraft	56
Australian Lightwing	14	Just Aircraft	58	Yarrowonga Flight Training	22
Bert Flood Imports (Rotax)	10	Leading Edge Aviation	58		



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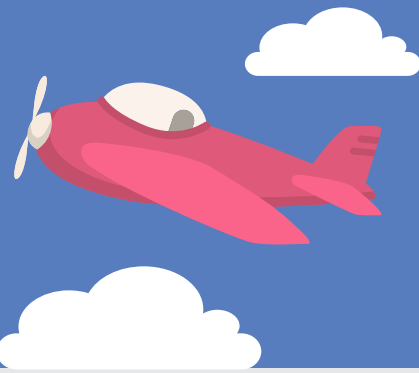
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BY WENDY BRUERE



WALKING from Dubbo airport to where Adam spends much of his time in the air, the young caseworker with the Uniting Doorways program talks about his work.

We arrive at a gate and on the other side is the fantastic yellow plane he flies. Adam has a pilot's licence and is in the process of obtaining his Instructor rating with the dream of starting his own flying school in the Dubbo area. He has been flying since he was 15 years old.

Adam is an exceptional practitioner and young Aboriginal leader in the Orana Far West community. He is also part of Jaanimili, the Aboriginal Services and Development unit in Uniting. The unit was born out of the 2007 'Dreaming as One' internal review of Aboriginal staff recruitment, retention and service delivery, which highlighted the importance of Aboriginal leadership and participation in all layers of the organisation.

"I've also worked in a Uniting family restoration program," he says. Family restoration helps children at risk of entering the foster care system to stay with their parents through early intervention and counselling. Adam has helped within the tight network that is the Aboriginal community.

He sometimes sees families he has

worked with previously and they seem grateful. "But it's not about me. It's about doing something good for the community."

Now Adam helps people by finding short term accommodation for homeless youth and those at risk of becoming homeless.

"There's not a lot of accommodation in Dubbo. Lots of people are homeless and so many are couch surfing. The government departments can't keep up with the need for housing."

Adam's dedication to the community is heartening. It's so evident he wants to help make life easier for people wherever he can.

"I really want to start my own flying school for Aboriginal students. It's something positive for young people."

"I wanted to get into the air force as a young fella, but then ended up having kids. So I didn't pursue that path, but I fly as often as I can with Wings out West, as often as time and finances permit."

Adam has two children, aged six and five,

and hopes to one day pass on the love of flying to them as well.

Adam's instructor and mentor, is Dan Compton, founder of Wings out West, who has 30 years flying experience.

"Dan was in the air force for 12 years and then a flying doctor", says Adam. "He motivates me and has helped me along the way and I want to do that for others. Even at work, the managers have been very supportive of me, especially with the flying hours. They're flexible – and they call me the Uniting pilot!"

Adam's passion and dedication are so strong, especially the importance of the community and family connections. It's not surprising he was nominated for Youth Worker of the Year in the 2015 NSW Youth Work Awards.

For more information about Uniting services 1800 864 846 or ask@uniting.org.

This article first appeared on the Uniting Blog

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