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The busy flight line at the inaugural Oz-Kosh fly-in at Narromine
Photo: Alan Betteridge

ON THE COVER

"There was so much to see and do at what will undoubtedly become recreational aviation's premier event."

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Imagine

BY MICHAEL MONCK

I'VE just come back from Narromine and the Oz-Kosh fly-in. What a great weekend. Hundreds of aircraft and pilots were there and a good time was had by exhibitors (one distributor of LSA aircraft told us he'd made four sales worth over $100k) and aviators alike. Many thanks to the tireless efforts of the RAAus staff who put in a tremendous amount of work over recent months and gave up their own personal time to attend and man the RAAus stand at Narromine.

I think we can call it a success. That's not to say we can't do better. Like most things in life, we learn a little more each time we do something. This event was no different. We came away from it having learned our hunch was right – working together does benefit everyone. The Narromine event was actually pulled together not by RAAus and not by SAAA. Nor was it organised by the HGFA or the APF. It was a collective effort from each of us. It was also a testament to the results which come from working together.

Walking around the airfield on the weekend I estimated about half the aircraft there were RAAus registered - which speaks volumes about aviation in Australia. Our numbers were boosted by the outstanding crowd of the gyrocopters and trikes which flocked to the event. Of the other half, most were amateur built and the remainder mostly general aviation. But not one of the sport aviation associations was more important than others over the course of the weekend.

Talking to people I heard comments suggesting the weekend was as good as, if not better than, the fly-ins RAAus organised in the past. I swapped stories with pilots of all sorts and learned a bit from our kin at the SAAA. I had a chat with some parachutists and spoke to the gyro guys. The world didn't tilt off its axis and the sky didn't fall in. We're not all that different as it turns out.

Recently we entered into an agreement with SAAA to share our safety management system with them. Both organisations recognise we conduct activities which are very similar in many respects and now each organisation will be able to use and learn from the de-identified information we each now use to improve the safety of the sport. Being able to examine a larger data set means we will be able to identify trends earlier and design education packages which will improve our collective safety. It will also allow us to manage our own affairs better and provide clear evidence to the regulator that we're doing our job. That has to be a great result for members of both organisations. And it doesn't stop there.

About a month or so before Narromine the self-administering sports aviation groups met CASA to discuss a number of issues. We were told by them that, after representations by our groups, they will finally be looking into medical reforms for all GA. This will be welcome. Imagine how much further ahead we would be if we had worked more closely together like this in the past.

RAAus has recently made submissions to CASA to allow RAAus pilots access to controlled airspace, as well as increase the MTOW of aircraft registered with us. This won't serve the interests of a lot of SAAA members - those who fly at night, do aerobatics or have four seats for instance - but it will help others.

When we speak with one voice we get a lot done. And it could benefit everyone. Imagine a world where you could build your aircraft with the expertise offered by SAAA members. To be able to tap into their network and technical skills to ensure you did the right thing. Get builder assistance from experts who made the same mistakes as you are about to make and who are willing to help you avoid making them. Then, once you're done building, you come and bring that same aircraft over to RAAus and take advantage of the simple rules for simple flying which we have developed over the past 30 or so years.

You could enjoy the privileges we have earned around self-maintenance (even if you haven't built your own aircraft), the self-declaration medical system we have proven to be safe and the insurance benefits we have in place. Pilots of other associations wouldn't have to wait for CASA to undergo reform.

Each and every one of these things is available to RAAus pilots and maintainers. It doesn't make sense to me to limit them to us. We could be sharing the benefits right now.

Walking around Narromine at the weekend I enjoyed the atmosphere. The chance to see a range of different aircraft from small to big, 3-axis to weight shift and whole lot in between. While the aircraft differed in shape and form, the pilots didn't – they all enjoyed chatting to one another and every one of them loved flying. Every single one of them.

Imagine a world where we could share, not only that love, but some of the great benefits each of our organisations has to offer. An inclusive world where all aviators were treated the same and no one felt superior.

The only time we should look down on anyone is when we're up there, marvelling at the world below.

DIGITAL DIRECTIONS

There are many ways to interact with RAAus these days.

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The Clare Valley Flying Group hosts monthly fly-ins at the Clare Valley Aerodrome in South Australia. Join us on the second Sunday of each month. BBQ lunch and refreshments. Tandem skydiving available. For more information clarevalleyflyinggroup@bigpond.com.

C. 7-8 JANUARY 2017
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B. 26 NOVEMBER
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D. 27 NOVEMBER
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E. 28-29 JANUARY 2017
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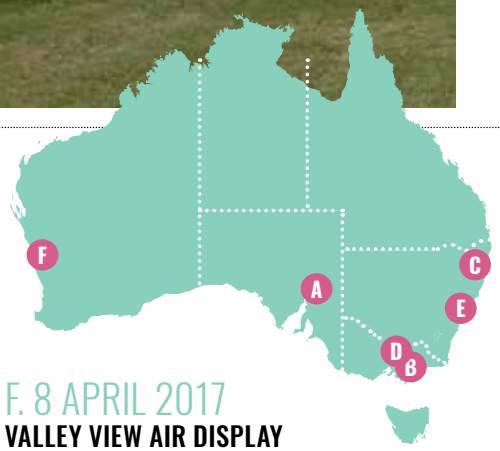
The airshow returns. A great family weekend with displays from vintage, warbird and aerobatics. Kid's rides and entertainment. Maitland Airfield's largest aviation event. Not to be missed. For more information, www.huntervalleyairshow.com.au or Facebook.



F. 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 Facebook.

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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.

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LETTERS TO THE EDITOR

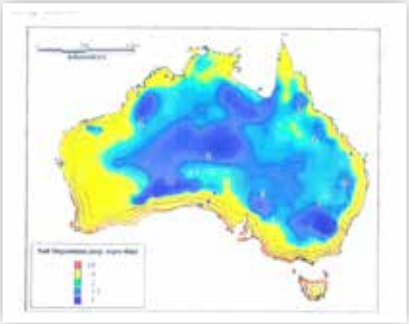
CARRIER FLIGHT

Re the article on the Blackshape Prime (*Sport Pilot* September 2016) and the claim for it to be the first ultralight to land on an aircraft carrier. Unfortunately, Angelo Petrosillo did not do his homework. Had he done so, he would have discovered that the first ultralight to land on an aircraft carrier was the Tipsy Junior G-AMVP, which landed on HMS Ark Royal by the Fairy company test pilot Peter Twiss on July 24 1957. The attached photo records the event.

The photo was obtained from Vincent Jacob's excellent publication "les avions TIPSY airplanes", which is a complete coverage of the E.O. Tips designed light aircraft. The book even includes factory construction drawings for the two seat Tipsy B-Trainer and the Tipsy/Fairey Junior.

MICHAEL ADAMS

SALTY DISCOVERY



Associate Professor Ray Hodges (Chemistry) pioneered Mogas in GA through CASA about 20 years ago and holds Supplemental Type Certificates for many GA types to run on Mogas. Also Ray markets a fuel volatility tester for checking that the Mogas is up to scratch.

On a recent visit we were discussing his trials and costs in getting the SIDS inspection completed for his C177. He pulled out the Cessna SIDS bulletin and showed it to me. It included a map of Australia which showed Canberra as a risk area for corrosion. Out of his papers dropped a CSIRO map issued by CASA on salt fallout. It puts south west WA, the Bass Strait coast, Tasmania and the south east coast of NSW and Victoria as all having high salt loads. Paradoxically Canberra has almost no salt fall-out.

GEOFF RAEBEL

X FACTORS

Just reading the latest magazine (*Sport Pilot* October 2016) and I have a few questions/ issues with the report on pages 36 and 37 for the X-Air aircraft.

Firstly the author lists the maximum take-off weight as 544kg. This is not correct.

The X-Air standard has a maximum take-off weight of 490kg. 544kg would overload the aircraft. It is important that the aircraft is only flown at its maximum design weight which is 490kg. The maximum take-off weight does differ for the other models in the range but the standard is limited to 490kg.

Secondly, the author comments on heaviness of the ailerons. This only happens if cables are incorrectly adjusted and are too tight. If the assembly manual information is followed correctly, pilots will find the aileron controls to be very smooth and lightweight.

Finally, the photos shown in the article do not show any registration numbers on the side of the aircraft as required by CASA regulations.

MICHAEL COATES

FROM RON KNIGHT - *The image without rego marking was taken before the aircraft was test flown. The suggestion it was a cable tension issue which provided heavy ailerons may be correct, but this would mean that all three X-Airs I have flown of this type had slack cables. And as a pilot writing up a report, I can only describe what the aeroplane felt like when I flew it on that day. And on that day, when compared to the many other types I have flown over 55 years, and in keeping with other X-Air 582s I have flown, the ailerons were surprisingly heavy in all of them. The owner provided the maximum weight details and I saw no reason to doubt them at the time.*

FROM THE ED *– Also, Michael, having no rego numbers in photos of aircraft is reasonably common in the magazine. In the blurb at the front of the magazine each month I state that photographs I use may be altered for editorial purposes. We sometimes digitally erase the rego letters of VH aircraft which can be registered RAAus so we don't get too many VH aircraft in our recreational magazine. And sometimes also on aircraft from overseas.*

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).

BAD LANGUAGE TO BLAME FOR DEATHS

An Australian academic claims communication failures are to blame for more than a thousand deaths in plane crashes.

Dominique Estival, from the University of Western Sydney, has reviewed the language used by pilots and air traffic controllers for her new book 'Aviation English'.

She says native English speaking pilots and controllers must adjust their communication to reduce the risk of misunderstanding by non-English speaking pilots.

Dr Estival was quoted in the Fairfax media as having heard pilots saying for example, "Cleared for the big smoke" when cleared for take-off, which was potentially dangerous where they were communicating with non-English speakers.

Dr Estival said other examples included the incorrect use of the words "inbound" and "outbound", saying "no" instead of "negative" or "yes" instead of "affirm" and using terms for numbers such as "nina" for nine.

"Not knowing the right terminology, phraseology and using the exact words can be deadly important," she said.

AOPA PRESSES FOR MEDICAL CHANGE

AOPA has begun a campaign to get CASA to change its medical requirements for GA pilots.

The Executive Director of AOPA, Ben Morgan, wrote to the Infrastructure and Transport Minister, Darren Chester in August to ask for his support.

Ben told the Minister the changes were important to the future of Australia's general aviation industry and, if implemented, would serve to reconnect thousands of perfectly healthy private pilots who had been unfairly discriminated against by the existing CASA AVMED system.

"This vital reform will dramatically reduce licencing costs to industry and remove unnecessary layers of bureaucracy and red tape which have contributed to the serious decline in GA pilots in Australia which, based on CASA's own data, amounts to more than 8,000 pilots exiting the industry," said Ben.

AOPA has asked for the standard for the Class 2 Medical Certificate be similar to that used by RAAus pilots - with no routine requirement to attend for medical examinations except when the pilot has a listed pre-existing condition.

AOPA's proposal would limit the medical to pilots in charge of aircraft weighing less than 2,500kgs, with five or fewer passengers, flying by day or night VFR. IFR rated pilots would still need to see a DAME every four years (two for older pilots).

SAFETY PARTNERSHIP

RAAus and SAAA have announced they will create a new partnership to share occurrence data and work together on safety management.

RAAus Chairman, Michael Monck, announced at Oz-Kosh the two organisations would work together to find simple, modern and mutually beneficial solutions to challenges faced by sport and recreational aviation participants in Australia.

He invited pilots of both groups to join the discussion.

Chairman, RAAus Michael Monck (L) and President of SAAA Rob Lawrie

NEW FAETA FROM ATEC

The new model of Atec's 321 Faeta NG (New Generation) was successfully tested in September.

The NG combines Atec's well-proven original carbon fibre Faeta wings with a new shape of fuselage and classical cross-tail. The fuselage, like all of Atec's aircraft, is made completely of carbon.

Atec's Australasian distributor, Dexter Burkill, says the conventional tail on the new Faeta is generating a lot of interest in Europe.

The main difference between the Zephyr and the Faeta is the wing structure. Carbon on the Faeta´s wings helps it reach higher performance and gives it different flight characteristics.

The new wings will include fuel tanks (100 litres) for the first time, giving the aircraft a range of 860nm. Dexter says the new Faeta NG will be available early next year and be priced competitively with the "T" tail version.

For more information, www.atecplanes.com.au

NEW RULES FOR DRONES

CASA has launched an easy to use online tool to teach people about the safety rules for commercial remotely piloted aircraft and recreational drones.

The eLearning tool has been released to coincide with changes to the commercial remotely piloted aircraft rules which establish a new under 2kg category. Operators in the category can carry out UAV flights without the need for a certificate and licence. This cuts red tape, saving about $1,400 and the need to create manuals and other documentation.

CASA has put strict operating conditions in place and has set up an online notification system. The notification system requires under 2kgs commercial operators to acknowledge they are aware of the strict operating conditions and that they know they must comply with the Civil Aviation Act and Regulations. For more information http://services.casa.gov.au/elearning/casa_101/

Historic approval

BY DARREN BARNFIELD, **RAAUS TECHNICAL MANAGER**

Michael Linke, CEO RAAus, congratulating Peter Tapp of Bolly Propellers with the first MARAP Approval certificate

RAAus achieved a significant milestone in October. It was one which will no doubt have a big impact in the future for owners of many heritage aircraft.

For the first time CASA approved an RAAus Modification And Repair Approval Process (MARAP). The approval was for Bolly propellers to be used on Skyfox Gazelles.

On October 14, CASA formally notified RAAus that it had accepted the engineering data package we supplied for the MARAP on the Gazelle.

This means the owner of a Skyfox Gazelle fitted with a 912a Rotax engine can now apply for a certificate for the fitment of a three blade ground adjustable Bolly propeller.

RAAus has identified 130 Gazelle aircraft owners who may be affected by this decision. Each one will be notified on how to take advantage of the process to allow them to legally fit the propeller.

RAAus has invested significant resources into the MARAP process and members wishing to take advantage of it will be required to pay a fee to obtain the necessary approval paperwork and certificate.

The approval was a watershed moment for RAAus. It brings the organisation's ability to approve modifications and repairs on all our legacy and heritage aircraft one step closer. Once each application is approved, CASA does not need to be involved in the process again.

We are still working with CASA on two other applications and hope to get approval for them soon. We have already begun the work to identify other aircraft which would benefit from the modification process.

RAAus would like to acknowledge the following members and organisations which greatly assisted in the process.

Dennis Bowden (sub-part 21m aeronautical engineer) from Bowden engineering, Stuart McColl who supplied his Skyfox Gazelle 'Flappy Bird', Mick Wright (an RAAus L2-L4), Lee Ungermann and Mick Poole from CASA and the team from Bolly Aviation.

Flappy Bird

Oz-Kosh Magic

PICS AND STORY BY ALAN BETTERIDGE

They say: “If you build it, they will come”. The same could be said of Oz-Kosh 2016. No one could have known just how successful the event would turn out to be. Hundreds of aircraft descended on the NSW rural town of Narromine in central western NSW over the first weekend in October.

Oz-Kosh Magic cont.

AFTER what appeared to be a never ending series of rain events in the months leading up to it, he weather cleared during the week beforehand, much to the relief oforganisers.

Aircraft started arriving early on Thursday and by day's end more than 100 had already made the trip.

By mid-morning Saturday the field was a sea of aeroplanes with craft of every conceivable type parked everywhere you looked.

Pilots had flown in from around the countryside, including Steve Drage who arrived after flying in from Albury in his Lycoming powered Brumby, one of only two remaining the country.

"You've heard of Drage's Aviation Museum?" Steve asked. "Well that has absolutely nothing to do with me," he laughed.

Generally pilots have two things in common: A love of aviation and a sense of humour. Steve has both.

Another early arrival was Keven Wedding who had flown his beloved Jab J120 to Narromine from Quorn in South Australia.

"I've had the Jab for four years now and it has never missed a beat," he said.

It had taken Keven 5.2 hours to get to Narromine and he said he enjoyed every minute of it.

"The Jab is so easy to fly and I am thinking of updating it to something a bit newer."

And what is he thinking of buying?

"Another Jab, of course, maybe a J160 this time though. It's a bit bigger, has more range and also a bit quicker," he said.

Father and son team Pablo and Richard Depetris made the journey from Wedderburn, taking just under two hours for the trip in their Cavalier.

"When I first saw the forecast, I wasn't going to come because they were predicting severe turbulence over the ranges and a stiff head wind , said Pablo.

"At about lunchtime on Thursday I had a call from a friend who had gone to Narromine in the morning and he told me that there was virtually no turbulence and I should come.

"I am glad we did because the trip was like riding on a magic carpet, it was so smooth. They were right about the wind, I had about 30kts on the nose.

"The ground speed was a tad on the slow side, but because it was so smooth I didn't really worry about it too much."

Oz-Kosh was all , about aviation, the people, products and most of all the aircraft.

A large number of exhibitors had a range of aircraft and products on display including Jabiru, Sling, Bristell, and Cirrus Aircraft.

Pablo Depetris and his son Richard almost didn't fly from Wedderburn due to predicted turbulence

Steve Woodham (left) and friend Adrian Clout flew from Port Macquarie in Steve's Sonex. Steve said the headwind he encountered added nearly 40 minutes to the trip

A great gaggle of gyros

Steve Drage and his Lycoming powered Brumby, one of only two remaining in Australia

Oz-Kosh Magic cont.

"The field was a sea of aeroplanes with craft of every conceivable type"

Michael Lawrence was proudly displaying his impressive Sling iS, which really stood out from the crowd in its red livery.

"I have absolute faith in the quality of Sling aircraft," Michael said.

"In fact I took delivery of this aircraft on a Wednesday and on Saturday headed off on an around Australia trip," he said.

"I didn't have one problem on the entire trip and I am not expecting any problems in the future."

"Errol from Global Aviation Products really looked after me and I would recommend anyone considering a new aircraft to give him a call."

Another aircraft which caught my eye was the tail wheel equipped BRM Aero Bristell.

Also bright red it looked like it was just waiting to take to the skies, a place where it excels.

The agent for BRM Aero had a sexy bright orange Ford Mustang parked among the Bristells. All weekend people asked them if they offered it as an option if you purchased a new aircraft!

The Mustang fit nicely among the sleek lines of the aircraft surrounding it.

As usual, one of the crowd favourites was the range of Cirrus aircraft looking every bit as elegant as the always do.

Oz-Kosh 2016 has changed my opinion of what a gyrocopter should look like. After what I saw on display, no longer do I think of them as basic flying machines. Such as the Cavalon. It looked resplendent in a pearlescent white. It was fitted with a panel which would not have looked out place in any number of high end aircraft.

The Jabiru stand drew a lot of attention over the weekend. They had one of their new Fourth Generation engines on display.

The new engines will be available in either an 80hp four cylinder or 120hp 6 cylinder versions and will offer pilots and aircraft owners the very latest in engine technology.

The engine on display was fitted to a J120 and the fit was, as usual, up to Jabiru's highest standard.

The engine is more evolution than revolution and will be an exciting addition to the Jabiru range.

According to Jabiru business manager Sue Woods the engines will be standard on all new Jabirus from January 2017.

There was so much to see and do at what will undoubtedly become recreational aviation's premier event.

The number of people and aircraft who attended is testament to the huge effort which had gone into the organisation of it.

Manufacturers, suppliers and aviation companies of all persuasions put their faith into the success of Oz-Kosh 2016.

I believe that faith was well founded and look forward to them continuing their support next year. If you missed this year's Oz-Kosh make sure you don't miss it next year.

It is well worth the effort to get there.

The Cavalon fitted with a panel which would not have looked out place in any number of high end aircraft.

Photo Oz-Kosh Narromine by Morrison Aerial Robotics

Michael Lawrence is super proud of his Sling iS, and, as can be seen, he has a right to be

Kevin Wedding flew over from Quorn (SA) in his beloved Jabiru J120

Of flies and men

Impressions of the first Oz-Kosh

BY BRIAN BIGG

YOU'D think the little bastards would have some sympathy for us. After all, we all fly, we're all aviators.

But the flies and mozzies became the talking point of everyone at Narromine during the inaugural Oz-Kosh in October. They were all over us, like we were wildebeests on the African Savannah. Flies covered every surface, every face, every back, every piece of food. The traditional Aussie wave was a feature of every conversation.

And the mozzies! None of your small, sneaky, silent variety either. These buggers were heavy lift monsters the size of five cent pieces. A swarm could have sucked a child dry in an hour. No sensible person left home of a morning without a generous coating of repellent.

The experts claimed it was the moisture which brought the beasties out in droves. The region was underwater a few weeks ago and, as I flew in on the Friday, the place was unrecognisable from previous years. There was green as far as the eye could see. And flowers. Who knew Narromine had flowers? I've camped under my wing on bare dirt in the past (never again of course), but this year there was a generous crop of green on which the adventurous could pitch their tents.

Of course, the insects didn't even wait for me to touch down. As I came in over the trees on final, the windscreen got mashed with bug guts. The leading edges looked like they'd been through a sausage mincer. Note to enterprising children – you would have made a fortune over the weekend going along the parking lines offering to clean the aircraft. I reckon you could have charged $50 and still worked non-stop (I want a percentage for coming up with the idea of course).

Nature's obvious sense of optimism was mirrored by the humans. There was a palpable feeling that everyone wanted to see Oz-Kosh become a 'thing'.

The last time I was in Narromine for a big fly-in (and Temora for that matter), it was sad. Few planes, few pilots, few members of the public, few companies hawking their wares, no reason to be there other than I had to be. A couple of years without a national fly-in, however, and there appears to be a renewed mood. After all, we need somewhere to fly so we can show off our beautiful machines.

Pilots came in their flocks from all over. Maybe this year, they all seemed to be thinking, things would be better. The count varied depending on who you spoke to, but the general consensus I heard was that 250-300 planes came and went during the weekend. Perfect weather in the north attracted Queenslanders like flies to a steak sandwich. The weather was a bit dodgier in the south, but quite a few managed to make it from South Australia and Victoria. And, of course, the odd explorer from the far west and far north.

You could tell the organising bodies, including the RAAus, had really put their backs into this one and things were better planned all round. Mick Poole from CASA, could be seen strolling the flight line still very interested in the arriving aircraft. Knowing he was there, meant I double checked all my charts and flight plans etc. That's never a bad thing.

The people of Narromine were glad to see us. Three times I heard the following conversations - in the RSL, in Coles and in a café. "Why is it so busy this weekend?" "The flying people are back." "Oh that's great." It's always nice to be wanted. Oh and a note to the management of the Narromine RSL (or USMC as it is known) – while the food in your restaurant didn't actually kill me, it came close. On Friday night I made the mistake of going for the salmon. An hour later it went for me. It won hands down.

Having Mogas available on the field was a great idea. The poor bloke carting his tanker around the lines had issues all weekend. First it was an electrical problem with the pump on Friday, then a disaster when a wheel bearing gave out on the trailer on Saturday. A call to a local mechanic had the problem solved a few hours later. By being patient we all got our juice. The Avgas blokes were busy, too, for the GA types and their enormous luxury four and six seat limousines.

I don't know if it was just me but there seemed to be a smaller variety of aircraft than

at previous fly-ins I've been to. In times past, you could rely on spotting a reasonably wide variety of strange beasts along the lines. Aircraft you'd mutter to yourself, "You'd never get me up in one of those" or "How the hell does that thing get off the ground?" This time it seemed every second aircraft was an RV variant, a Jabiru or a Cirrus. Are the days of a thousand different types coming to an end? Are we all choosing to buy aircraft like we buy our cars? With an eye to after-sales service and the inevitable resale price rather than how excited they make us feel? It would be sad if that is the case. The aircraft up for awards were truly works of art and drew appreciative crowds. Some of the workmanship shown among our colleagues is amazing.

The weather played its part all weekend, but it would have been nice to see more members of the public there considering how much work had gone into it. Narromine is a big drive from Sydney but a few dollars spent on national marketing wouldn't go astray. Marketing is something I've been banging on to RAAus about for some time and it's at fly-ins like this where you can see if the message is getting through. More marketing brings more feet through the gates, which means more income for everyone, which allows you to put more money into marketing. It's what is called a virtuous circle.

"You could tell the organising bodies had really put their backs into this one"

What I did like was that the event included UAVs for the first time. Drones are a fact of life for us now. And they have started becoming big things, especially for businesses like film and television companies. The models on display at Narromine were impressive. The aerial photographs in this magazine were taken by one of the drones at a fraction of the cost than if it had been taken from an aircraft or chopper.

The forums conducted by RAAus staff and others were well targeted and the ones I poked my nose into all appeared well attended. Lots of questions about *Sport Pilot* and even compliments from people about how things in RAAus were running smoothly now.

Chairman Michael Monck appeared both pleased and a bit taken aback by the positive comments about the way he is running the show. You got the impression from Mick's reaction that he normally gets brickbats, not roses.

The other current RAAus board members were there as well, Barry Windle and Tony King (At the last Natfly I spent the entire weekend calling him 'Jim' thinking he was Jim Tatlock. He didn't correct me, the mongrel, because he was enjoying himself watching me make an idiot of myself). Former board member, Mike Smith, was cruising around enjoying himself at the displays. The other new board members weren't due to take up their roles until the AGM (see elsewhere this edition).

Overall, I think the sense of optimism by everyone was well placed. There were signs pilots want this to work. The companies which had their products on display had a variety of reasons why their stuff was popular or not - but most were positive about it all. The aerial displays were interesting and the weather co-operated until the end, allowing us all to get there and get home safely.

I think I'll go back next time. You should too, but remember the fly spray or suffer.

The highpoint of the weekend for me? Struggling with my four heavy bags along the flight line and having the nice bloke in the golf cart offer to give me (and them) a ride to the aero club rooms. What a treat.

The low point? Standing and chatting to Sue Woods from Jabiru in front of their unusual looking twin engine aircraft. I wasn't really paying attention when I asked her, "What engines are in it, a couple of Rotaxes?" She looked at me funny then replied politely. "No, they are Jabirus". D'oh (face slap).

My beautiful 'Mimi' (unquestionably the best aircraft ever) standing proudly in the flight line

You grown-ups don't understand us teenagers

Happy faces

BY BRIAN BIGG

During a tour of Natfly one year, my young son and I were walking the line examining the variety of birds on display when he turned to me and told me seriously "Dad, we should never fly in a plane which doesn't like us."

I replied, "Of course not, son" with no real idea of what he meant until he pointed at the front of the nearest aircraft.

"Aahh".

This is what he meant and this was some of the range of emotions on display at Oz-Kosh in October.


Aaggh, watch out


Don't worry be happy


Oh, you naughty thing you


Achtung!


What are you touching there, Doc?


Oh my God, don't make me go flying again!


I couldn't eat another thing


Oh woe is me. He's going to take me flying again


Tee hee

A night to ~~remember~~ - forget

BY ALAN BETTERIDGE

PEOPLE WHO ATTEND WEEKEND FLY-INS FACE THE DIFFICULT CHOICE – SLEEP UNDER THE WING LIKE A TRUE ADVENTURER, OR WIMP OUT AND GO TO A MOTEL WHERE THEY HAVE PROPER BEDS. ALAN BETTERIDGE TRIED BOTH. IT WAS NO CONTEST.

IN the many years I have spent visiting and writing about aviation events, I have often thought about the people who fly in, set up a small tent under the wing and camp for the night.

The sight of tents under the wings of aircraft conjures up visions of days gone by when barnstorming aviators would land in paddocks around the country and offer rides to the locals.

These intrepid pilots would often stay for two or three days before moving on to the next town.

I, on the other hand, normally travel with my wife and have our caravan in tow. But I have often thought about how nice it would be able to just set up a tent and camp for evening.

So when the editor proposed a story comparing a tent adventure with a hotel stay, I was keen to try the experience. Fortunately, my wife had other commitments on this particular weekend.

Why not buy a small tent and experience the delights of a life outdoors - at least for one night? How bad could it be?

A small three man, pop-up tent would do the trick. I put one of the camp stretchers and airbeds I had purchased many years ago – just in case the kids came home for the night – to good use.

Upon arrival I found the camp area to be full to overflowing and had to settle for a very small space between two motor homes, the owners of which didn't mind my intrusion into their space.

A woman from one of the motorhomes even passed along the helpful comment that it had been very cold that morning and the cold was expected to return the next morning.

I set up my newly purchased tent and discovered the people it referred to in its description as a 'three man' tent must have been very small people or very close friends.

There was no way you could stand up in it and it was barely big enough to fit the camp stretcher.

Not to worry, I thought. It was only overnight after all.

The tent was quickly erected, the airbed inflated and all was well with the world.

Evening came and I sat back to enjoy the events as they were about to unfold – or so I thought.

By 7pm it was getting cold – very cold – so I gave up the idea of sitting there watching the stars and decided just to go to bed.

It was at this point, I discovered my airbed had started to go flat already - this did not auger well for the night ahead.

I pumped it up again and settled in. As I lay there, I slowly but inevitably descended into a sea of cross bars and spring coils. This was going to be a long night.

By 10pm the airbed was as deflated as my desire to camp out in a tent ever again.

What followed can only be described as lengthy periods of being awake interspersed with moments of sleep.

By 4am I had given up on any chance of more sleep and got up drudgingly to face the new day. It was not as much getting out of bed as it was rolling over and falling onto the cold, hard ground.

The lady in the motorhome had been right. It was cold, no question about it. A quick check of the car's OAT display showed a chilly three degrees.

To add insult to injury, the coffee my beloved had prepared for me had leaked out of the thermos, spilled over the back floor of the car and gone stone cold.

I realised then that the romantic idea of camping under the wing in a tent, and the reality of it, were different kettles of fish.

To top of it all, I had paid $20 for the privilege of a sleepless, cold night. At least the lessons learned were worth the 20 bucks.

So in future when I see people camping under the wing of their aircraft I will feel pity, not envy.

Does anyone out there want to buy a small three man tent and useless airbed? Call me.

The culprit – a deflated air mattress says it all. Notice how it has descended into the camp bed

The brand name should have been an omen

A tent too far

AFTER my disastrous decision to sleep in a tent, I made a momentous decision - no more sleepless nights for me.

The Oz-Kosh website suggested the Narromine Tourist Park so a call was made to book my wife and I for the three days of the event.

What a great decision that turned out to be.

The park is situated right next door to the aerodrome, in fact it shares a dividing fence and is within walking distance of the entire airfield – a great boon when you fly in and have no ground transport.

Park owners, Jo and Terry McDonald, purchased the park only seven months ago after Terry was made redundant in the mining industry.

"After more than 30 years working underground in the coal mining industry, taking on a caravan park was quite a change," Terry said.

"But Jo and I really love it."

The park's location makes it an ideal place for pilots and their crews to stay and, with Jo and Terry going out of their way to make pilots welcome, it is a great place to either overnight or maybe stay a few days and explore the region.

"It is great to meet people who have flown in. Terry and I are only too pleased to give them a lift into town or arrange to get them fuel," Jo said.

"In fact I have even loaned my car to a few of them so they can have a look around," she added.

The park offers either campsites ($15 unpowered or $25 powered), hot showers and clean amenities or, if you prefer, they have a range of motel type accommodation.

There are 11 ensuite rooms, a communal kitchen and lounge/dining area.

"If pilots are just stopping over for a short time the showers are available for just $10," Terry said.

> "Jo and Terry go out of their way to make pilots welcome"

Most pilots have had times when, after a turbulent flight, we would have killed for a shower before refuelling and heading off again.

"If pilots are coming this way and would like us to arrange something for them, all they have to do is call and we will do our best to help."

"The Oz-Kosh event was an eye-opener for us, we just couldn't believe how many planes and people attended," Jo said. Jo and Terry are providing a great service for recreational pilots. They should be supported.

The park can be contacted on (02) 6889 2129.

A sting i

BY JOHN CALLAHAN

AFTER MANY YEARS FLYING GLIDERS, MOTORGLIDERS AND LIGHT AIRCRAFT AROUND AUSTRALIA, I KNEW WHAT I WANTED IN A COMFORTABLE AND SAFE AIRCRAFT. MY RESEARCH LED ME TO THE TL 2000 STING S4.

n the tail

It has good cruise speed and endurance, it's Rotax powered, a nice build quality of composite carbon fibre with good flight characteristics and safety. TL Ultralight is a well proven manufacturer.

After all my due diligence locally, I then took a trip to the TL-Ultralight factory in the Czech Republic.

As readers of *Sport Pilot* already know, the Czech Republic is only one third the size of Victoria but has a dynamic aviation industry. Approximately 35 companies produce EUR1billion worth of aviation products a year, a large percentage of which is exported.

There are 19 manufacturers of UL/LSA aircraft in the Czech Republic producing between 200 and 400 aircraft a year.

The government is supportive and there is collaborative work with the universities.

TL-Ultralight is the largest of these manufacturers with 25 years of production experience.

I spent three days at the TL-Ultralight factory in Hradec Kralove. This city has a population of 93,000 and is rich in history and architecture in the old part of town, but modern in the new areas. At the factory, I was shown the production process from start to finish.

After the CAD and analysis, the mold making is carried out in a very large five axis milling machine capable of making precision molds up to nine metres long.

After a polish the carbon fibre lay-up begins with carbon rovings added to stress areas. The whole area is coated with resin and the vacuum bagging sealed. Vacuum is then applied. Once cured and out of the mold, the part is then oven cured. 85% of the aircraft is carbon fibre.

Large parts are trimmed by a robot.

After a final polish, the parts go to the paint shop where the number of coats depends on whether they are for the UL or LSA markets.

There is a constant hunt to save grams, even the firewall is different material for UL. For quality control each part is weighed before and after every process.

On the assembly line, shells gradually grow into airplanes with all airframe parts being made in house. The comprehensive CNC machinery allows production of wheels and brake assemblies, the constant speed propellers and many other parts.

The fuel tanks are treated with a special product to protect them from ethanol in any fuel which may be used by design or accident.

A sting in the tail cont.

The customer's selections of engine, instruments (digital and / or analog with graphics) finish it off. Final inspection and weighing follow, then test flying and the new aircraft is ready for its new owner.

I GOT TO GO FLYING

A Sting S4 was fueled, inspected and rolled out of the hangar ready for me. After few words and a lot of hand signals (my Czech safety pilot spoke very little English and I spoke no Czech), it was time for me to seat myself in the left seat. The leather seat and adjustable pedals made it very comfortable, considering my 183cms 95kg size and similar dimensioned co-pilot. The large canopy on this aircraft was tinted blue, which you didn't notice when it was closed.

Full choke and the cold Rotax started immediately, then the twin Garmin G3X touch screens sprang into life. Waiting for oil to reach 50°c gave me plenty of time to do my cockpit checks.

Taxiing out, the nose wheel steering and toe brakes made it very maneuverable. After some radio traffic in Czech I got the hand signal to go. I lined up on 34R and noted the 10kts crosswind. Flaps set at 15°, propeller fully fine and full throttle. The ground roll seemed quite short when I rotated at 90kmph (I was not used to kmph) and we settled into a steady climb of about 700fpm after flaps up. After a right turn, we were soon near the cloud base of 3,000ft. The Garmin lady was very busy with traffic announcements. This was a training airfield and I was sharing it with five C152s, four helicopters, two Antonov AN2s and two RPTs, all in a foreign (to me) language. There are 200 airfields in Czech Republic – and it is only one third the size of Victoria!

After a few touch and goes I was told to use 34L grass because an RPT was coming in. The aircraft this day were using left hand circuits on 34L and right hand circuits on 34R. All good experience.

Flying around in the Sting S4 provided a great scenic view of the countryside, with large areas of crops interspersed with small towns. The Powermax propeller gives you the choice of two methods of operation, either in-flight adjustable or constant speed. I used the constant speed which is operated by a lever beside the throttle. At 80% power, 220kmph (120kts) straight and level was comfortable. The controls were well balanced with a roll from 30° left to 30° right taking less than two seconds.

Slowing down on downwind took a while because it is a slippery aircraft. Stabilising at 135kmph (75kts) with 15° flap on base leg, the final approach at 120 kmph (65kts) and 40° flap, led to an easy landing, even with the 10kts crosswind.

"How much excitement could I have in one day?"

A few safety features need highlighting. A couple of quick tests with the Garmin autopilot pointed me back towards the home airfield and showed me that recovery from an unusual flying attitude was easy if I pressed the Straight and Level button.

Also if I approached an angle or attitude outside the preset flight parameters, the Garmin servos applied some pressure on the control stick indicating to me that I shouldn't go there.

Stalls were no drama. There was plenty of warning from the Garmin angle-of-attack alert progressing to a stall warning. There was some buffeting and a nose drop.

Recovery was prompt with little loss of height, sink rate of about 500fpm at 130 kmph or 70kts with engine on idle.

When all else fails the Galaxy Ballistic Recovery Parachute handle is within easy reach.

On both sides of the canopy frame there is a NACA duct which feeds fresh air to eyeball vents for pilot and passenger. As well there are vents at the front of the canopy and pop out vents in the sides. Plenty of ventilation for hot weather flying.

GETTING STREAMY

For something different, my next flight was in the TL Stream. This is the latest project by TL-Ultralight and the Wow factor is very high.

The tandem seating and small frontal area, along with a retractable undercarriage and constant speed Powermax propeller, plus sleek aerodynamic design, made it look like it is ready to go anywhere. Settling into the cockpit you can't help being impressed by the ergonomic layout and the big touch screen. The side mounted joystick is right where you put your hand, as are the control buttons on the joystick. Electric adjustable rudder pedals make it the perfect fit for me. This aircraft also comes with a rescue parachute and autopilot.

Taxiing out to 34R again I got the feeling I was in a jet fighter – oh yeah. The ground run felt quite short and the climb out impressive. This aircraft was exciting to fly and very responsive. Apart from a pleasant fly around the Czech countryside, the main thrill came when we were cleared to do a low pass down the main runway at 300kmph just before landing. The strength of the Stream is obvious. This was proven during the wing loading tests when they exceeded the design loads by 270%. The build is composite carbon and Kevlar fibre. TL has signed a memorandum of understanding with the Egyptian government for a turbine version of the Stream.

My time had run out so I didn't have time to fly the high wing TL 3000 Sirius. It's known as the gentleman's aircraft, because it is easy to get into with its lift up doors, and is easy to fly. The Sirius is popular with flying schools. Build quality and finish is impeccable and it is the ideal cross country aircraft with a wide and comfortable cabin.

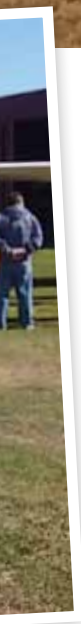
Anyway, how much excitement could I have in one day?

John has since become the Australian distributor for TL Ultralight. For more information, tl-ultralight.com.au.

Wings, wheels and hot ham rolls

BY KEVIN WILSON **PRESIDENT GRAFTON AERO CLUB**

Mark Awad arrived in his Winjeel



THE weather was perfect this year much to our relief. It had been overcast with showers last year but this year's Wings and Wheels at Grafton went off without a hitch.

The number of exhibitors was similar to last year. But this time around we had a number of vehicles from the Coffs Harbour Veteran and Vintage Car club to add to those from Grafton and the Coffs CEX club. Exhibitors began to arrive shortly after 8:00am and the first aircraft arrived an hour later. Pretty soon the whole aerodrome was buzzing with the sounds of aircraft in the circuit, aircraft taxiing in and cars, motor bikes, stationary engines and people everywhere.

Mark Awad arrived in his Winjeel and began providing adventure flights. Coffs Harbour Aero Club Flight Training provided TIF flights as well.

Morning tea in the clubhouse proved very popular again and the BBQs were turned on around 9:00am.

> "Club members were run off their feet"

This year as well as the standard sausage sandwiches, we offered hot ham rolls and Mann River burgers, both of which proved very popular. More than 40 aircraft flew in from around the state and southern Queensland. Everyone seemed very happy and enjoyed the casual atmosphere, especially being able view the exhibits and aircraft up close.

While visitor numbers were difficult to determine, people came and went all the time, we estimate around 2,500 people strolled through the gates, many of them families with children.

Club members were run off their feet to ensure the event ran smoothly. Even with a number of members unable to assist due to the flu and other commitments, there was not a single issue throughout the day and we managed to raise over $1,200.00 for the children's ward of Grafton Base Hospital, $500.00 more than last year. The event is growing nicely.

VOLUNTEERS MAINTAINING Y2150 - YHTA

IN April Nature Foundation of SA (https://www.naturefoundation.org.au) volunteers held a working bee at Hiltaba in the Western Gawler Ranges on Eyre Peninsula. Our group was tasked with painting the tyres and other markers around the runway. Everyone asked me what the numbers meant and I didn't know. Later I noticed on Ozrunways some airfields near the west coast of Eyre Peninsula have 2000 series numbers. In the photo you can see Mt Hiltaba (1,477ft) in the distance, the highest point in the Western Gawler Ranges. From Mt Hiltaba it is possible to see the Ceduna silos 70nm to the west on the coast. The runway is rarely used but the NFSA likes to keep it in good condition for RFDS in case it is needed.
Douglas Ransom

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.

A hex on Mode S

BY NEIL SCHAEFER

RECENT CONTACT FROM AIRSERVICES HAS REVEALED SOME AIRCRAFT OWNERS AND IMPORTERS ARE STILL PROGRAMMING MODE S TRANSPONDERS INCORRECTLY.

While this may not appear to be much of a safety problem, a serious safety issue is presented to Airservices if two aircraft with the same (incorrect) registration number appear in the same airspace. The system simply cancels out both aircraft and they disappear from radar!
This is intended to avoid confusion for controllers, but results in aircraft no linger appearing on radar.
Pilots believe they are visible to controllers, yet are not able to be safely managed as a result.
The letter below provides guidance to aircraft owners to correctly enter the Hex code and registration for their aircraft.

RECREATIONAL AVIATION AUSTRALIA
Recreational Aviation Australia Inc.

U3/ 1 Pirie Street
PO Box 1265
Fyshwick ACT 2609
Tel: 02 6280 4700
Fax: 02 6280 4775
www.raa.asn.au
Facebook: www.facebook.com/RecAviation

ABN 40 070 931 645

OWNERS OF AIRCRAFT FITTED WITH MODE S TRANSPONDERS

Since the introduction of transponders fitted with mode 'S' capability, numerous aircraft have been identified by Airservices Australia as having the incorrect ICAO 24 bit Address configured in the transponder. Many of these aircraft appear to be RA-Aus registered.

The worldwide Mode S system relies on this Address being unique for every aircraft. When it is incorrect there is a chance that it will duplicate the Address of another aircraft which can cause interference and confusion for radars and ATC and may interfere with other dependent systems like TCAS.

A correct Mode S Address issued in Australia will be a 24 bit or 6 digit HEX number in the range 7C0000 to 7F0000. The registration number for the aircraft should not be used as the Mode S Address, for example, "241234" (for aircraft registration 24-1234) is NOT the correct Mode S Address, even though the transponder may allow this to be configured. A registered HEX code must be obtained from CASA by emailing, aircraft.register@casa.gov.au.

In addition, advice from Airservices Australia has confirmed the details they would like displayed in the Flight ID field. This should be programmed as "R" then the last four digit identifiers in the aircraft registration e.g. R1234. This allows Air Services to distinguish the return interrogation as a recreational aircraft and prevents errors being generated in the ATS classification framework.

If you have already been issued with a HEX Address from CASA and programmed the correct Flight ID, please email ops@raa.asn.au the details. RA-Aus will keep a register of the HEX and Flight ID codes so that Operations can assist Airservices with verifying the data upon request.

Yours sincerely,

N. Schaefer.

Neil Schaefer
Assistant Operations Manager
Recreational Aviation Australia Inc.

RAAus Ltd inaugural meeting

ON THE WEEKEND OF OCTOBER 15 -16 RAAUS HELD ITS FIRST BOARD MEETING AS A COMPANY LIMITED BY GUARANTEE.

We welcomed the return of some familiar faces with Tony King, Trevor Bange, Eugene Reid and Rod Birrell being reappointed as directors by the members. In addition to the returning board members we also have Luke Bayly who, while being a fresh face on the board, added valuable input throughout the meeting. As the Chairman, I look forward to working with the entire board, both old and new, through the coming year.

Michael Monck
Chairman

ELECTION OF CHAIRMAN

The first order of business for the meeting was to elect a Chairman for the upcoming period. Michael Linke, as the company secretary, called for nominations and Barry Windle nominated Michael Monck. Eugene Reid seconded the nomination and there were no other nominations. Michael Monck was appointed to the role uncontested and will continue in this capacity.

DIRECTORS TERMS

Also on the matter of elections the board agreed to giving transparency to members on the term of directors. Our constitution states that at least two of the longest serving directors must stand for election each year. While this will not be a problem for 2017, in the following year the five incoming directors will have all been serving for the same length of time. Clause 36.3 addresses this by saying that the directors can select those requiring to stand for re-election randomly, or come to an agreement. In the interests of giving members clarity, the board has agreed that Tony King, Trevor Bange and Eugene Reid will sit for a three year term with Rod Birrell and Luke Bayly sitting for a two year term.

REPORTS

The board and management presented reports relating to the activities of RAAus over the past year. A summary of the various reports is available in the Annual Report.

MEDICALS

In light of recent developments around the world and the resulting decisions about medical standards, the board had a discussion about the standards required for recreational aircraft. The board has agreed to develop a 'fitness to fly' document along the same lines as the Australian Parachute Federation's 'fitness to parachute' guidelines. The board has also agreed to undertake a review of the current standards with a view to creating a clearer alignment with drivers' licence requirements that are well understood by medical practitioners.

RISK

The board resolved to form a risk and audit committee and acknowledged the work done by staff in improving our overall risk profile.
Barry Windle was elected chairman and Luke Bayly was appointed to the committee.
The committee will also include external representation by Lorenzo Mazzochetti.

LIFE MEMBERSHIP AND OTHER AWARDS

Two members were nominated for life membership - David Eyre and Graeme Hutchinson. Each of these members have significantly contributed to the organisation by giving up personal time to promote, support and encourage RAAus activities within the aviation community and the broader community at large. The submissions for these members was received by the board and both members were accepted.
In addition to accepting two new life memberships, the board agreed to accept guidelines for life members in the future as well as develop guidelines for meritorious service and the pioneer awards. The guidelines will be made available to all members on the RAAus website.
A story about David Eyre will appear in the next *Sport Pilot* edition and one on Graeme in the edition after that

BOARD MEETINGS

The board resolved to reduce expenses associated with meetings by reducing the time for face to face meetings. Where appropriate, face to face meetings will be held on one day with a reduced timeframe in order to minimise the impact of accomodation and other incidental expenses associated with travel. In some instances this may not be achievable such as where direct flights are not available, however, for the most part directors should be able to fly in and fly out on the same day.

In total there will be four meetings throughout the year with two being face to face in accordance with the constitutional requirements and other meetings held electronically. Out of session items will be discussed outside of the regular meetings.

STAFF RECOGNITION

The final business for the day involved thanking the staff for their contribution. The senior management staff were invited to attend the meeting to allow the board to express their gratitude for the efforts put in over the year.

It is easily overlooked that staff give up a great deal of their personal time to spend extended periods away from their homes and families to ensure that RAAus functions as it should. In recent times there have been safety forums, flying instructor updates, fly-ins and meetings which have taken our valued employees vast distances away from familiar places and we appreciate their contributions greatly.

OTHER MATTERS

Other matters of importance to members including *Sport Pilot* and fly-ins were all discussed and, as the board develops positions, members will be consulted and informed. As an example, consultation has already commenced on the recent Oz-Kosh event.


MARALINGA
AIRFIELD
J-160
JABIRU

A flight into history

BY RICK FRITH

Arrival terminal- No ASIC required

EMU AND MARALINGA

'The whole Project is a striking example of inter-Commonwealth co-operation on the grand scale. England has the bomb and the know-how; we have the open spaces, much technical skill and great willingness to help the Motherland. Between us, we shall help to build the defences of the free world, and make historic advances in harnessing the forces of nature'.

Minister of Supply, Howard Beale, May 1955.

Nine nuclear bombs have been detonated on the Australian mainland, two at Emu and seven at Tietkens Plain, near Maralinga. With a bit of planning and preparation, you can now fly into both these sites and learn a little about this incredible episode in Australian history.

The first British atomic bomb was tested in the hold of an old warship at the Montebello Islands in October 1952, off the WA coast near the current oil and gas fields around Barrow Island. The weather window at Montebello was always very short, so after two more tests they were relocated to a temporary site at Emu, 250kms west of Coober Pedy.

Totem#1 and Totem#2 bombs were about 10 kilotons each and were exploded on towers at Emu in October 1953. A magnificent 1,600m gravel airstrip survives in excellent condition, with the remnants of the scaffold-built control tower. About 20kms to the south-east of the strip, concrete obelisks mark ground zero for each test. Totem#1 produced the widely reported Black Mist which caused dangerously radioactive fallout more than 170km away at Wallatinna near the Stuart Highway.

The airstrip is YEMJ, Emu Junction at 28 37.5S 132 12.3E. It lies on a claypan in the Woomera Prohibited Area and Maralinga Tjarutja lands. You will need to obtain permits from both the Department of Defence at http://www.defence.gov.au/woomera/permit-tourist.htm and the traditional owners at http://maralingatjarutja.com. When planning, you can check exclusion periods at http://www.defence.gov.au/woomera/exclusionperiods.htm. On the day, you should confirm the Woomera restricted areas are not active and do a few low passes before landing to check for feral camels.

Due to the lack of water and difficult terrain at Emu, a new test range was built 170km to the south at Maralinga, which is now outside the Woomera Protected Area.

Taranaki bomb site. 29 kilotons was the largest detonated at Maralinga

Turning final on runway 18 at YMRA

Totem #1 test site

Sand melted by the blast

Unused balloon test site

"Hearing the story was quite spine chilling"

However, a Maralinga Tjarutja permit is still required and all visits must be guided.

In contrast to Emu, Maralinga is a highly developed destination. The 2,500m concrete airstrip (YMRA at 30 9.8S, 131 37.5E) was build to service heavy military transports with a design life of more than 50 years. It is a metre thick and the landing zones at each end are more than three metres thick. It includes a vast apron and huge taxiways with wide radius loops at either end for turning, parking and radiation wash down. It was the only emergency landing field in the southern hemisphere for the space shuttle and is worth a visit in itself. At its peak, it was base for up to 20 Lancasters (or their later variant, the Lincoln), Victor bombers and various support aircraft.

The only building surviving from the test era is the cavernous terminal hall, complete with English style 15amp power points, and optimistic 'No parking' signs adjacent the car park.

We had previously arranged a guided tour with the Maralinga caretaker. Since we had no ground vehicle, we joined him in his vehicle on a tag-along tour for a 4WD club. There are plans to eventually have a 26 seat bus, so larger fly-in tours can be accommodated.

We travelled north to Tietkens Plain, where the seven atomic bombs were detonated. These tests were either at ground level, on 100ft towers, hoisted 1,000ft aloft by balloons or dropped from a Valiant bomber. Two additional sites were built for balloon and tower tests respectively, but never used, since the Americans finally allowed the British to use their Nevada test site. The layout and remnants at these two unused sites clearly illustrate how the tests were conducted.

Hearing the stories of an aboriginal family camping in the Marcoo bomb crater after the blast, and seeing just how close were the foxholes where servicemen witnessed the blasts, was quite spine chilling.

More sinister than the bomb tests, however, were the euphemistically named 'minor trials', which tested neutron initiators and the safety effects of burning and blowing up bomb components and radioactive materials. It is these tests which produced the most insidious and persistent contamination, leading to several extensive cleanup efforts over the following decades. The long life plutonium and the undisclosed cobalt tracers are now buried in deep pits at various locations, some of which are visible from the air. The Taranaki test site is a conspicuous marker, with the distinctive radial patterns where the plutonium plumes were cleaned up.

The only structures remaining above ground at Tietkins Plain are the equipment sheds from the latest cleanup and a few balloon tethers, but evidence of melted sand is everywhere.

After a day of touring and a comfortable night in the spacious donga accommodation at Maralinga village, our two Jabirus departed for less remote destinations, with much to consider about this legacy of the cold war era. One thing I learned was that Len Beadell, of Gunbarrel Highway fame, was both the surveyor and major contractor for the Woomera rocket range and the person who selected both Emu and Tietkens Plain sites. When developing the thousands of kilometres of roads throughout the Woomera test range, he pioneered many of the routes through the remote outback still in use today. You can see his grader on display at the Giles Meteorological Station ... but that's a destination for another trip.

A view from CASA

Peter Gibson, CASA

As we approach the end of yet another year, *Sport Pilot* asked CASA a couple of questions about recreational flying. Peter Gibson, CASA's Corporate Communications Manager responded on behalf of the outgoing boss, Mark Skidmore.

WHAT WAS DONE RIGHT IN RECREATIONAL AVIATION IN 2016?

A number of Sport Aviation Organisations are actively introducing SMS into their organisations ahead of the regulatory requirements under CASR Part 149 currently under consultation.

One such organisation, the Australian Parachute Federation, has proactively introduced Safety Management Systems through their organisation right down to every drop-zone operator and facility. This gives them an active head start on systemically managing the safety of their operations and being compliant with CASR Part 149 at its introduction.

WHAT WAS DONE WRONG IN RECREATIONAL AVIATION IN 2016?

Given recent changes made across CASA, some organisations have bypassed normal communication pathways and are bringing routine issues and requests through to CASA senior management instead of through the relevant areas. This however does not normally yield better outcomes for these organisations.

In fact it makes maintaining effective working relationships more difficult.

WHAT'S ON THE CARDS FOR NEXT YEAR?

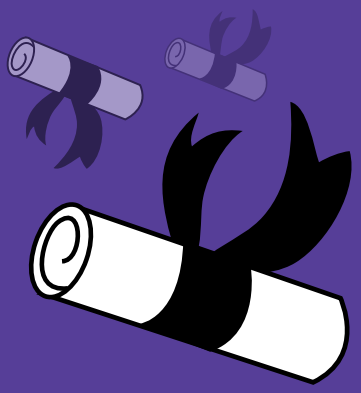
Next year will see a major shift in how sport aviation is regulated in Australia. There will be the implementation of Part 132 for replica and historic aircraft, the introduction Part 149 for Approved Self Administering Aviation Organisations, Part 131 for balloons and Part 105 for parachuting.

The introduction and implementation of new regulations and transition to their requirements will require extra work by CASA and the sports aviation community.

The extra work will be worthwhile for better safety outcomes and more streamlined regulations.

Pouring the mold

BY PROFESSOR AVIUS **AVIATION GURU**



There is a saying which goes back many years, "You cannot teach common sense". Decision making is most often based on situational experiences.

And then there is the other saying, "If I had only known then what I know now – things would have been so different".

When we enter aviation as student pilots, we basically have little knowledge (although in the modern world of the internet there is much we can research on just about any topic) but the instructor forms the mould into which we will hopefully be a conforming product.

The issue is this– as instructors we cannot hope to pass on to every student every event and learning we have experienced in aviation. Often we fail (or at least partially fail) because the things which become second nature to us, skills developed through situational experience, tend to slip through because they are not specifically in the syllabus and, because they have become second nature, they slide in importance.

Yes the theory is explained – purpose –the sequence demonstrated – exercise – and competency in the sequence assessed - PEA. When operating in the real environment there are some situations where we have little time to assess and respond, while in others there is virtually unlimited time to assess and react. Picking up a wing on short final doesn't leave much time to assess and react (it's instinct). Planning a flight to a fly-in in a couple of weeks provides plenty of opportunity to assess and plan.

"The learning has to start somewhere"

SUPPLEMENTARY KNOWLEDGE

The RAAus website contains some really great Safety Fact Sheets under the title 'Knowledge Base'.

The current topics listed are:

- Ballistic Parachutes
- Batteries
- Distress Beacons
- Environmental
- IMSAFE
- Refuelling
- Search and Rescue

The Fact Sheet on batteries is very interesting and refuelling should be of special interest, because at some stage most RAAus aircraft have been refuelled from a drum or jerry can. As indicated at the beginning of this article the learning has to start somewhere. Use these Fact Sheets and ensure you communicate the resource to all within your operation.

FINALLY

A good example about flight planning and decision making. Much of the country has experienced unseasonal weather. The south east has endured a very wet winter and the trend has continued into the first month of spring. Aside from local floods and crop destruction, there have been many road closures. Recently a person contacted me. He had his Pilot Certificate, passenger endorsement and had recently gained his cross country endorsement. He was considering attending a social event which would have involved an extended trip across much of the flood effected south east. He had considered driving, but wasn't overly enthused by the prospect of the road closures and detours caused by the local flooding, which significantly increased his travel distance. However, he continued to be lured by his recent cross country endorsement and the thrill of the prospect of flying to the event. But he had reservations about flying because the countryside was extremely wet, the weather dodgy and, in the event of a 'situation' developing, he wasn't confident about being able to manage all prospective emergencies.

From an aviation perspective, the good thing about it was that he was thinking, identifying the risks and planning to mitigate those risks. He asked me what I thought about his situation. I told him he was 90% of the way to making the right decision. He asked 'How's that?" I replied, "Remove the flooded/extremely wet countryside and replace it with a scenario of an extended flight over tiger country – inhospitable with few suitable landing areas, would he do it?" He replied "No, because of the lack of suitable emergency landing areas." I told him, "You've answered your initial question". He drove to his social event, the long way around, but should be pleased with himself. He had made the right decision himself. And that's the basis for every good pilot.

OPS MANUAL

The new Operations Manual is a good read. There is a great explanation of the changes at:

https://members.raa.asn.au/storage/1-explanation-of-issue-7-1-changes-august-2016.pdf.

It is important all schools get up to date with the content. If you don't know it ,it will be difficult for you to impart the knowledge.

The flight that counts

BY ROB MATTHEWS

I think it is hard sometimes to forgive yourself for mistakes you make, especially in aviation because it is something we work very hard at and have spent a lot of money doing.

It's especially hard for me, a relatively new Pilot Certificate holder. I've already made mistakes, some silly and some potentially unsafe. One thing I have learned and want to tell other young pilots about is something UK billionaire Richard Branson says. Branson has made numerous mistakes and errors but bounced back each time.

He says, "Do not be embarrassed by your failures. Learn from them and start again".

Another saying is, "When you put your heart and soul into something, any mistake can feel like a disaster. Everyone fails sometimes – it is what you do next that counts. Don't give up".

I am sure everyone can relate to these sayings, whether it was a bad landing or a rushed pre-flight inspection which led to an issue during flight. We all have stories.

These sayings also reflect a lot on my own aviation story. During my early training I conducted an intersection departure, reducing my taxi time, but also reducing around 900m of the 1,500m runway. I thought it would be safe because I knew the aircraft I was flying could take-off in just 100m and land in around 90m.

One day soon afterwards I went flying with my instructor and he made me go right down the very end of the runway. We took off and before I knew anything, he cut the power.

I safely touched down, but with only 100m of the runway remaining in front of us.

What did I learn?

That my instructor had seen my intersection departure and, knew the best lesson would be the one learned the hard way.

I realised what he was getting at. If I had conducted that intersection departure and the aircraft lost power for real, I would have ended up in a house or the grain lot which is just past the runway. From that day on, I understood the comments pilots make about how the one of the most useless things in the world is the amount of runway behind you.

I was embarrassed for my actions, knowing I was, at the time, only an 80hour pilot and he had been watching me. It made me feel really small that I also displayed poor Airmanship because of a bad decision. I was embarrassed enough to consider giving aviation a rest for a while.

Instead I took Richard Branson's advice and booked a lesson the following weekend and have been flying happily since. I am now glad I learned that particular lesson so early on in my flying career.

As I draw closer to 100 hours in my log book, I face a new worry. I am told by many pilots to be very careful because a lot of accidents happen around this time. I hope I am can report to you in a few years that my changed attitude to my flying meant my next hundred hours passed safely. It's what I will do next flight which counts.

> "The best lesson would be the one learned the hard way"

Chad wins maintainer award

BY DARREN BARNFIELD, **RAAUS TECHNICAL MANAGER**

Chad Summers, from NSW, was the winner of the inaugural Maintainer of the Year award.

Runner up Dan Compton from NSW

2016 Maintainer of the year awards

The award was judged by an independent panel of members from the recreational and general aviation community and the winners announced at a barbecue which followed the AGM in South Australia in October.

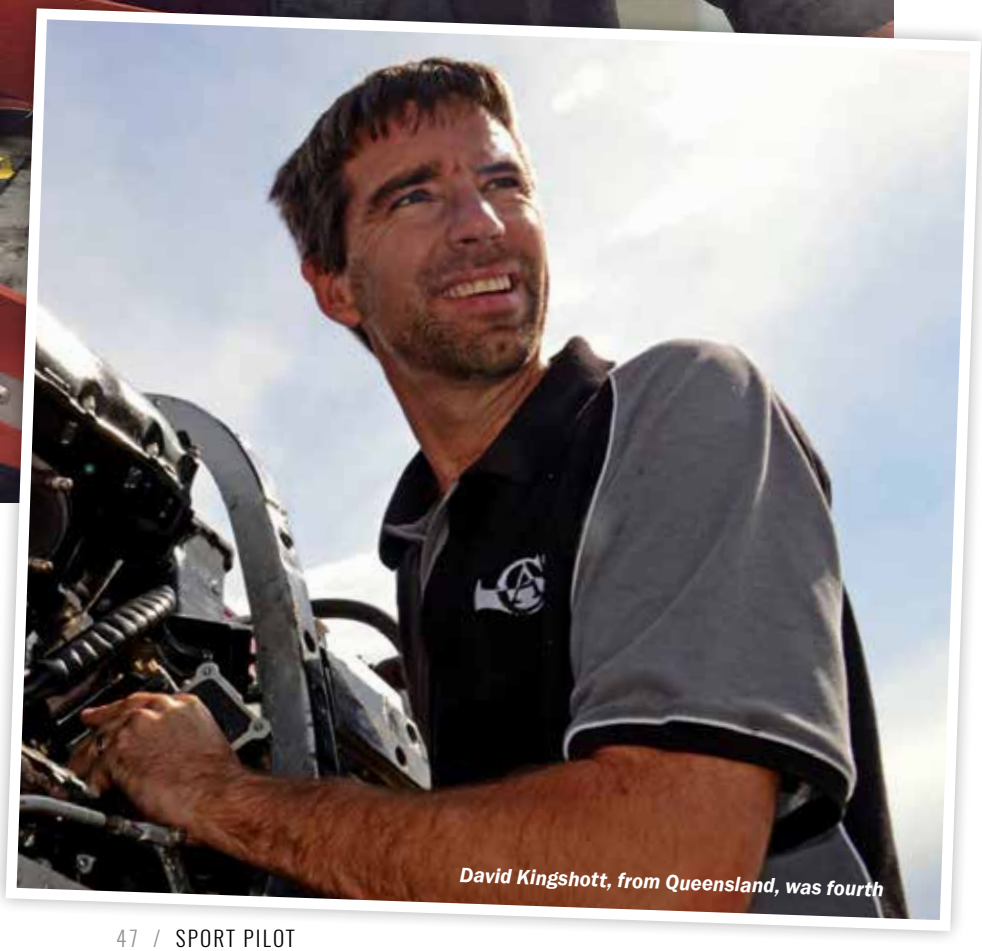
The awards were a long overdue recognition of the value of the maintainers to our community. They work hard to keep our aircraft in the air.

As a prize, Chad received a return trip to the 2017 EAA Air Venture fly-in at Oshkosh, Wisconsin (supplied by RAAus) plus a travel toolkit (supplied by the Industrial Shed).

Dan Compton, also from NSW, was runner up to Chad. Dan received a Bolly Bos 3 ground adjustable propeller (supplied by Bolly Aviation) as well as a Jabiru engine course (supplied by Jabiru Australia).

Mick Wright, of South Australia, was third. He received a travel toolkit (supplied by Foxbat Australia).

Mick Wright, of South Australia, was third.



David Kingshott, from Queensland, was fourth

David Kingshott, from Queensland, was fourth and received Rotax engine course (supplied by Mark Lester, a Rotax authorised training agent).

At the awards presentation, RAAus congratulated the winners and extended a special thank you to everyone who nominated their local maintainer. Details of how you can nominate someone for the 2017 Maintainer of the Year award will be released in the coming months.

Keeping the conversation going

BY JILL BAILEY **NATIONAL OPERATIONS MANAGER**

Jill (second from the right) with the hard working crew in the RAAus tent at Narromine

RAAUS has now completed its second annual National Safety Month campaign and, even though we are headed towards the worst time of year for accidents based on our analysis (possibly due to good weather and lots of hours in the day to fly), so far our accident rate has remained low.

We know our reporting culture has improved out of sight and we seem to be having good ongoing conversations with pilots and maintainers about safety.

So, how do we keep this conversation going? How do we make sure our flying stays safe? I have been rereading previous Pilot Talk articles and have noted a common theme. As pilots, we can't become complacent. As an organisation, RAAus can't become complacent. The next flight for any of us may only be a routine one around the local area, but we should nevertheless maintain awareness of our physical fitness and use the same checklists and routine processes to stay safe. This was brought home to me as I prepared to fly home from Narromine after the success of Oz-Kosh.

It had been a big build up to the event for me, with our CTA and MTOW proposals going to CASA, coming off the back of the latest revisions to the Ops Manual, uncertainty about the new fly-in, the pressure of delivering presentations and my generally high personal fatigue levels.

I had flown to Narromine on Friday morning, using up extra nervous energy due to the high traffic levels. We were kept really busy with long days in the RAAus tent, sociable and informative discussions with pilots and among ourselves, disruption to normal routines and I was still very tired. Sunday was a quieter catch-up day, with most pilots departing early to beat the next round of rain.

I helped pack up the tent and tidy up the location. I knew I was tired, but because my flight home was only 1.5 hours, I had a tailwind and had pre-planned my flight, needing only to input the weather, I didn't foresee any issues.

My first hint of possible problems was the difficulty we encountered moving my aircraft to a safe starting position. I had the rest of the RAAus posse helping (mostly, they were busy talking) but it seemed to be harder than usual to push the Tecnam out of the tie-down area and position it to start safely. Once I climbed into the cockpit, I found out why. I had left the brakes on. You idiot! Clue one.

Next, I started up, waved goodbye to the crew, and ran through my usual after-start processes. No radio? What the ....? Idiot, I had unplugged my headset because I was going to take it out of the cockpit, but then decided to leave it in the luggage area in its carry bag. I plugged the headset in and what do you know? Radio calls started coming through. Clue two.

Now I was becoming a little paranoid. What else had I forgotten? What would I discover that would bite me on the flight home? My awareness for potential problems rose a notch or two. Fortunately, nothing else happened and I managed to hit all my waypoints within a minute, stay on heading and height and arrived safely at Temora right on time. I did, however go straight to bed for a much needed snooze.

I probably put pressure on myself. Michael, the CEO, had booked us all for an additional night at Narromine, to allow us to rest and recover. But due to the deteriorating weather, I elected to fly home Sunday afternoon right after the event debriefing.

As a result of my earlier errors, I was certainly more vigilant than usual during the flight, thinking about my frequency changes, checking my locations and managing my fuel. The errors may have actually done me a favour, keeping me paranoid and watchful.

What could I have done differently? Easy. I could have stayed the night and arranged a hangar for the aircraft. And if the weather was ok, flown home the next morning. If the weather was no good, I could have been driven home by the RAAus crew heading towards Canberra. Any number of the locals at Temora would have been happy to have the excuse to fly me back to Narromine later in the week to pick up my plane.

But the flight has been a good excuse to keep the conversation going. Which is my point. When we share our experiences (they don't all have to be hair raising) we learn from each other's mistakes.

When we share our experiences, even when we risk sounding like an idiot, we encourage and develop a good reporting culture. And when we get used to sharing our experiences, we keep each other safe - which reduces the serious and fatal accident rate. That's worth sharing.

Getting ditched
Feedback and further thoughts

BY RICK FRITH

My series of articles on ditched (*Sport Pilot* August, September, October 2016), has led to some interesting feedback.

One retired Air Force trained, Tasmanian pilot who regularly crosses Bass Strait added the following:

- Plan to leave in the morning so the searchers have maximum daylight to find and rescue you;
- Always carry enough fuel to return (I have seen a wall of fog and cloud form over Cape Grim and know what he means);
- Always do a full, in-cabin ditching rehearsal, as the last thing before taxi. He once discovered his dinghy was back with the luggage;
- Practice, practice and practice your ditching procedures before your trip until the actions become automatic.

Another pilot who regularly commutes to his weekend getaway on Flinders Island makes a point of doing an extra thorough pre-flight inspection and physically dipping or filling the tanks before the over water leg.

For those who have wondered if it is better to ditch or hit the trees, I recommend this thought provoking article. http://www.equipped.org/watertrees.htm.

One ditching instructor I spoke with at Oshkosh this year was adamant you should assume that, once in the water, you will only have the survival equipment you were wearing on your person when in flight. They train their students to use the Emergency Breathing Systems, described in my article, if relying on a ditching bag or multi-person life raft.

With this same philosophy, the Bass Strait veteran uses the Australian made Roaring Forties 'S.A.V.E.R System', an integrated harness, life jacket and dinghy. It costs about $1,600.00 and weights 2kgs. It can be found here: https://www.r40made.com.au/ROARING-FORTIES-S.A.V.E.R.-System.html.

Another Oshkosh pilot uses US Coast Guard anti exposure coveralls when crossing the nearby lakes. These are overalls with closed cell foam lining and lots of pockets for emergency gear. They are not watertight, but have Velcro straps around the wrists and ankles.

> "Flying over water is serious business"

They provide a little buoyancy, but a life jacket is also required. His aim was only short term protection against cold shock and swimming failure, not long term protection against hypothermia.

Many ditchings occur due to engine failure after takeoff at low level, raising similar concerns to Victor One.

If you regularly take off over water, at least learn the basics of ditching survival, even if you don't carry all the equipment needed for long over water adventures.

Finally, if flying a powered recreational aircraft, your life jacket does not have to be CASA approved. Under CAO Part 95 you have to wear one if flying beyond gliding distance from land, but it could be a good quality, manually inflated marine design.

Search for CASA AWB 25-013 for more information.

Flying over water is a serious business. If you are going to, for whatever reason, ensure everything is done to minimise both the probability of ditching and the consequences if it does occur.

Clear prop

BY DAVID EYRE

THE FIRST IN A SERIES OF STORIES FROM FLYING INSTRUCTORS. THEY ARE DESIGNED TO BE EDUCATIONAL, AMUSING OR SERIOUS – SOMETIMES ALL THREE. THEY CARRY A MESSAGE ABOUT SAFE OPERATIONS.

SOME years ago, I was the CFI of the Canberra Aero Club. One day I was walking down the line of parking bays. No doubt my mind was occupied with student pilot antics and I was not paying too much attention to my surroundings.

"Clear prop!"

The ubiquitous shout woke me from my desultory reverie and I looked up to see a warbird about to start-up. I immediately noticed it still had a tow hook attached to it and the tow hook was in a position where the propeller would hit it.

"Nooo!"

I yelled and waved my arms madly, rushing across to explain my intervention.

The pilot, whom I knew, was suitably embarrassed and grateful. I had saved him from considerable expense - a destroyed tow-hook, CSU propeller and probably a ruined engine.

THERE ARE A COUPLE OF THINGS TO LEARN FROM THIS STORY.

- Always in a loud, clear voice, yell out "clear prop". Do not be embarrassed to really yell out, even if it frightens the hell out of your instructor or passenger.
- Always pause after yelling. Give plenty of time for an observer to answer you.
- Always have a purposeful lookout before and after the yell. Make sure a cat hasn't wandered under the prop.

Clear Mind – Clear Prop!

David welcomes your own short aviation anecdotes. Email them to editor@sportpilot.net.au.

Back to being a coward

BY BRIAN BIGG

Just when I think I will never be any good as a pilot, I do something which both amazes and pleases me, and gives me hope that one day I might be as good as some of those around our airfields who obviously have the right stuff (they have moustaches and wear leather jackets with patches all over them).

I have almost a full log book in command now, and have flown all sorts of aircraft in all sorts of conditions. I have scared myself to death dozens of times and am proud of the fact I never make the same mistake more than once (well, perhaps more than twice).

But my aviation career is littered with examples where I have been too cowardly for my own good.

I have stood in front of my aeroplane, completed my pre-flight checks, then had a nasty feeling -nothing more than a feeling - that something wasn't right. So, despite it being a beautiful day, I've pushed the aeroplane back into the hangar and gone home.

At other times, I have cancelled long-distance flights because my reading of the weather charts made me think that I wouldn't get there and back as planned. I cancelled three trips to Natfly in a row because the weather looked dodgy for the period I expected to travel.

I can still remember driving to Temora under perfect blue skies and grinding my teeth at how much of a coward I was for not having 'gone to see the conditions for myself' like the moustaches tell me they always do.

At least on that particular trip it rained and rained during the drive home so I guess my judgement, while cowardly, is not necessarily wrong.

> "I had reached the zone when they say I would feel like I knew everything"

And I think this overly cautious approach to my flying has gradually built up a sedimentary layer of experience which gives me some comfort when I have to make tough decisions. Let me give you a recent example.

Like a lot of pilots trained in GA I have a fascination for reading weather charts - weird, I know. I bore my kids by reminding them that I am actually a licenced meteorologist just like the glamorous girls on the Weather Channel. Well not exactly like them, I suppose.

I have recently relocated to Sydney after several years up the coast. But my aircraft didn't move with me. I left it in the hangar in Ballina until I found a new home for it.

That took quite some time, because very few places in the Sydney basin care about ultralights. Do you realise there is no north-south runway anywhere south of Newcastle? If you run into a strong southerly, you need to make sure you have enough petrol to turn around and scurry back north.

After some searching, I secured a place at Camden and the weather waiting game began. I had to make sure I had a window of opportunity where the conditions were good enough to fly the jet to Ballina and return under my own steam, preferably the next day, to save money. And ideally, I had to do it before my quarterly hangar rental fee at Ballina was due, otherwise I would be paying twice.

But after weeks of beautiful weather, as usual I had left it too late. The endless blue days of early autumn gave way to the blustery, cold conditions of winter exactly one day after I signed my new lease at Camden. Front after front marched across NSW bringing bitterly cold weather and strong winds. No ultralight conditions for weeks on end. Then one day, with time running out, I noticed an unusual aspect to the weather charts I was studying.

A strong front was due through NSW the following Tuesday (it was Friday now), expected to bring strong winds and rain. But it was fast moving and the different weather programs I consulted all agreed it shouldn't last more than a day. Marching right along behind it was a second, slower and weaker front, expected to bring similar conditions which would persist. Between the two there appeared to me to be a gap of perhaps as long as a day where the air would be settled and still and the sky clear. It would be a narrow window, but the more I looked at it, the more I felt it was a feasible one. I made the choice to go for it.

I booked the jet for early Tuesday and made my way to the airport in the forecasted rain and blustery conditions. The flight was packed and delayed by more than an hour. The weather was just as bad on arrival in Ballina. I started to think I had wasted my money. I went to bed early that night, fully expecting to have to book another jet ticket back to Sydney to wait for another day.

But when I arose before dawn, the sky was clear and there wasn't a breath of wind. That high-pressure lull between the two fronts was sitting right on top of NSW just as forecast.

I updated the weather and winds for my flight plan, which confirmed my local observations, and set out an hour or so after dawn. I enjoyed a completely beautiful day's flying. There was the merest touch of a headwind up high, but nary a cloud over Australia that I could see. My beautiful aeroplane operated perfectly and there was no traffic.

I made one stop on the way to fill up with petrol. My overly cautious nature insists I not arrive in Sydney without near-to-full tanks, in case I have to turn around and go back north to find a landing place. I made it to Camden just after lunchtime and, when I informed the tower it was my first time landing there and that I was moving in, the friendly tower staff made me feel like a long lost member of the family. What a great crew. I was very happy. I was even happier that night when the wind picked up and started to blow. The next morning was grey, cold and wet and it blustered for weeks. I had, quite brilliantly I believe, picked the only weather window in weeks.

I began to think maybe I was done with being an aviation coward. It teaches you to never stop being on your guard, sure, but obviously it also had built my level of skill and experience quite nicely. Maybe, I thought to myself, I might have to buy myself a leather jacket and sew a few patches on it.

When I was adding the trip to my logbook, I was chuffed to see I had finally gone over 600 hours, which got me thinking. That total sits smack bang in the zone of experience they say is when pilots mostly kill themselves. When you no long feel like a learner. When you consider yourself to be an expert. It's well short of the number of hours you need to get to the happy zone of being an actual professional.

So, I had reached the zone when they say I would feel like I knew everything. And it was true. I was finally feeling like I knew everything. Damn. Only one thing for it, I guess. I got out the razor and trimmed my beginner moustache. Back to being a coward.

Airmanship saves lives

BY OWEN BARTROP

PART ONE OF A MULTI PART SERIES ON ONE OF THE MOST MYSTERIOUS ASPECTS OF BECOMING A GOOD PILOT.

RAAus has produced figures from its analysis of accidents over the past six years which are disturbing. 44 fatal accidents caused by pilot error, a situation not acceptable in this day and age. The question safety personnel are asking themselves is "how do we reduce this figure?"

It's not only lives lost. It's aircraft destroyed, it's families and friends deeply affected by grief. Also, these accidents affect all aviators because they increase the cost of flying and the cost of insurance premiums. Even safety related remedies increase our costs. In some circumstances over-regulation not only increases costs, it decreases safety.

SO WHAT SHOULD WE DO?

The answer is Airmanship (it is a general term for both male and female pilots). There are many definitions of Airmanship. RAAus defines it as: something indefinable, perhaps just a state of mind, which separates the superior pilot from the average: it is not a measure of skill or technique, but rather a measure of a pilot's awareness of their aircraft and its flight environment and of his or her own capabilities and behavioural characteristics, combined with good judgement, wise decision making and a high sense of self-discipline.

Wikipedia defines Airmanship as: a sound acquaintance with the principles of flight; the ability to operate an airplane with competence and precision both on the ground and in the air; and the exercise of sound judgment which results in optimal operational safety and efficiency.

It does not matter which definition you prefer it all boils down to the realisation that Airmanship is a question: "What do I do and when do I do it?" In the RAAus version the 'what' and the 'when' are underlined. If you think about the Wikipedia definition, the first two points cover 'what do I do?' and the last point is all about 'when do I do it?'

You might notice Human Factors has not been mentioned. Although Human Factors does cover Airmanship to some extent, it mainly deals with other things.

To start any discussion of Airmanship you must ask yourself "why do I fly?"

The answer for most of us is to have fun. Some might say they fly to go from point A to point B. That might be true, but on arriving at point B, don't you want to have fun? And wasn't it fun flying to point B?

But the risk is that setting out to have fun can lead us to not to take flying as seriously as we should. We know it is a serious business, but do we really take it seriously?

We want an aircraft to be like a car - hop in, turn the key and away you go. That's not the reality, but there are pilots who wish it was.

Another factor is how often we fly. To keep current and in top flying condition, a pilot should fly at least an hour a fortnight. And that is stretching things. It would be much better to fly at least once a week. Obviously the costs and the busy lives many of us lead, means once a week is not always realistic. If that's you though, keep in mind you have to be an exceptional pilot to fly only once a month and not make mistakes.

So here is some of the nitty gritty of why we have accidents – some of us do not take flying seriously enough and many of us are not as current as we should be. So what can we do about that? The answer lies in Airmanship - knowing what to do, how to do it and when to do it.

You might note the phrase, "how to do it" has crept in. Although it is not part of the definition of Airmanship, it is an important part of flying, normally referred to as training and experience.

The 'what to do' part is our knowledge of what we fly, how we fly it and the environment in which we fly. In other words, training and experience, as well as skill. Pilots can pour over books, attend lectures and ask for advice and, while these do help, there is nothing like practice makes perfect. This ties in with how often we fly and what we do when we do fly.

But do thousands of hours make you a better pilot? Not necessarily, even if you fly the heavy metal.

Most flying hours for commercial pilots are spent monitoring gauges and buttons, manipulating switches and levers - very little is actually spent flying the aircraft.

The three pilot crew of Air France Flight 447, with 20,000 flight hours experience between them, failed their crucial Airmanship test in 2009 when their aircraft crashed into the Atlantic Ocean. It had stalled at 40,000ft and the crew apparently did not realise it until it was too late. As a contrast, Sully, who landed in the Hudson River, and Richard de Crespigney, who had an engine explode on Qantas flight QF32 from Singapore to Sydney, used their Airmanship. Both pilots stopped trying to find out what was wrong with their aircraft and started thinking about what they had available to land it. It paid off and no lives were lost.

Both pilots had also received military training, which is strong on emergency procedures. Military pilots need to be taught what to do when their aircraft is damaged by enemy fire so they are taught what actions they need to take when, not if, that happens. That is: 'What do I do and when do I do it? Airmanship.

NEXT: Applying Airmanship to emergency procedures.

A bolt from the blue

DESIGNING YOUR OWN AIRCRAFT BY DAVE DANIEL

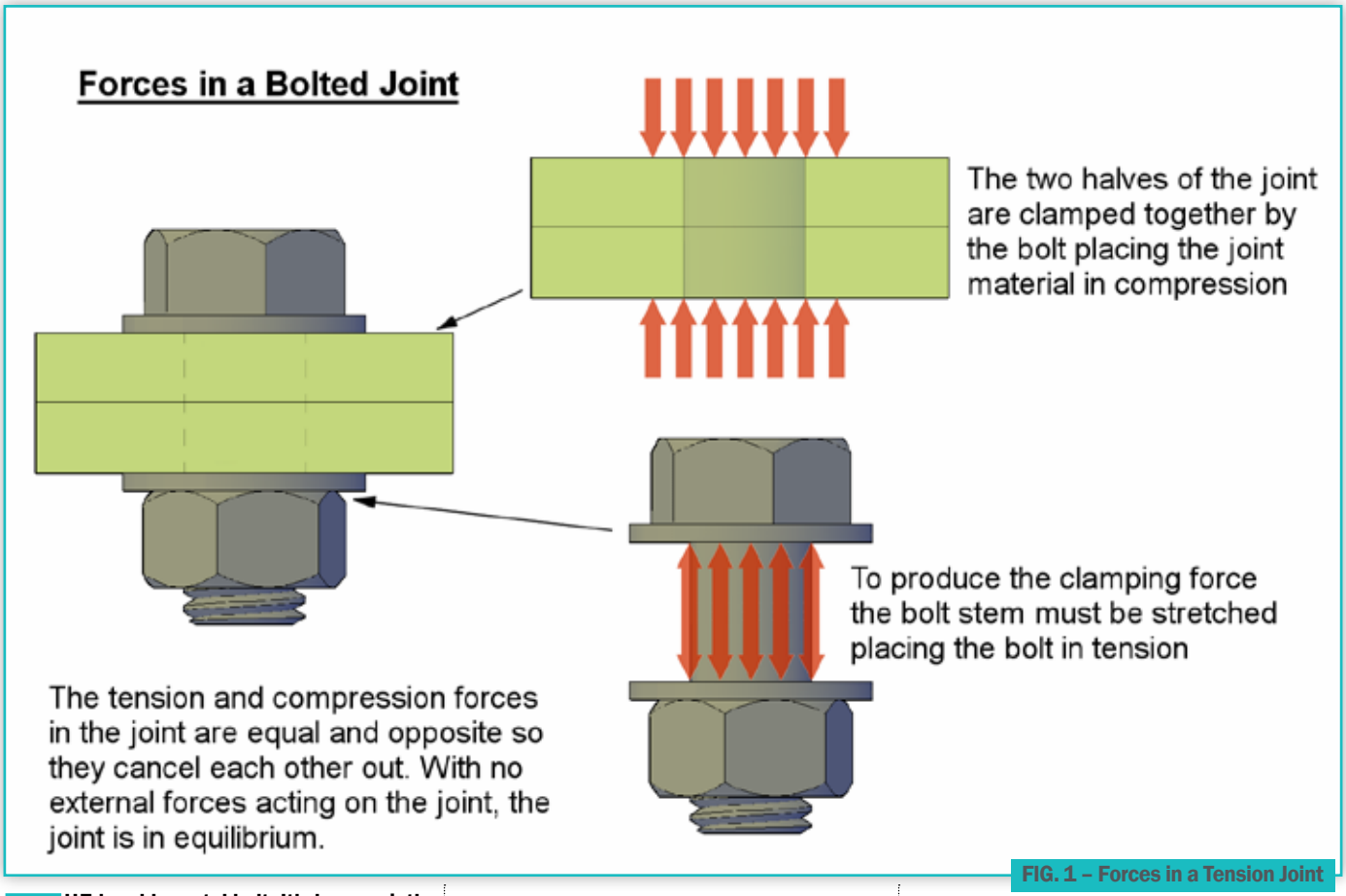


FIG. 1 – Forces in a Tension Joint

THE humble metal bolt. It's been quietly going about its business for the past few hundred years pretty much unheralded. Cheap to produce, incredibly strong for its weight, durable and requiring only the simplest of hand tools to install, this workhorse of the engineering world is so ubiquitous it goes virtually unnoticed.

At least until you try and remove one with a corroded thread!

Bolts may be common, but they are definitely not well understood, at least not beyond professionals and those of us with unusual engineering nerd tendencies. The prime reason for this is that for run-of-the-mill, non-aviation uses, installation is seldom critical; bolts just get done up 'tight' and 'she'll be right'.

For more exacting applications, an installation torque may be specified and a conscientious mechanic will get out a torque wrench and tighten to spec – a more demanding process no doubt, but one which requires very little additional thought. It's only if you happen to design bolted joints that you really need to understand them, and then you quickly discover they are not quite as simple as they appear

FEEL THE TENSION

Bolts are typically loaded in one of two ways, tension or shear (or a mixture of both). Shear will have to wait until next month because I'm going to kick-off by looking at bolts loaded in tension. The critical point to grasp when thinking about tension joints is that all the parts actually behave like springs; they may not look like springs because the extensions and compressions involved are very small, but they are springs nonetheless. When you insert a bolt and tighten the nut, it compresses the material around the hole while simultaneously putting the shank of the bolt in tension (as shown in Fig. 1). Just like springs, the material around the hole squashes slightly and the bolt shank stretches slightly. Exactly how much squashing/stretching occurs depends on the stiffness of the parts and the preload in the joint and it is these characteristics which are critical to the joint's performance.

Fig. 2 is a graph of extension vs force. Force is on the vertical axis which may look a little strange, especially if you are familiar with force vs extension diagrams where force is usually on the horizontal axis, but bear with me.

The joint material, shown in blue, is being compressed so it's 'extension' is actually negative. Also, in this particular case, the joint is much stiffer than the bolt so there is less compression in the joint material than extension in the bolt at any given load (i.e. the blue line is steeper than the red line). To make this information more useable we can rearrange the graph into Fig. 3.

By moving the compression data to the right hand side we create something called a Joint Diagram, which turns out to be very useful especially if, like us, you want to see what happens when a joint is loaded in tension.

Intuition sometimes fails us and bolted joints are one of those instances. It's easy to imagine that, for a joint in tension, the bolt will simply pick up any applied load - increase the load by 1000 Newtons and the bolt will experience an extra 1000 Newton load - but unfortunately intuition is wrong, and it's just not that simple.

Going back to our spring analogy, by tightening the nut and applying a preload, the material sandwiched in the joint behaves like a compressed spring and the bolt itself like a stretched spring.

A bolt from the blue cont.

DESIGNING YOUR OWN AIRCRAFT BY DAVE DANIEL

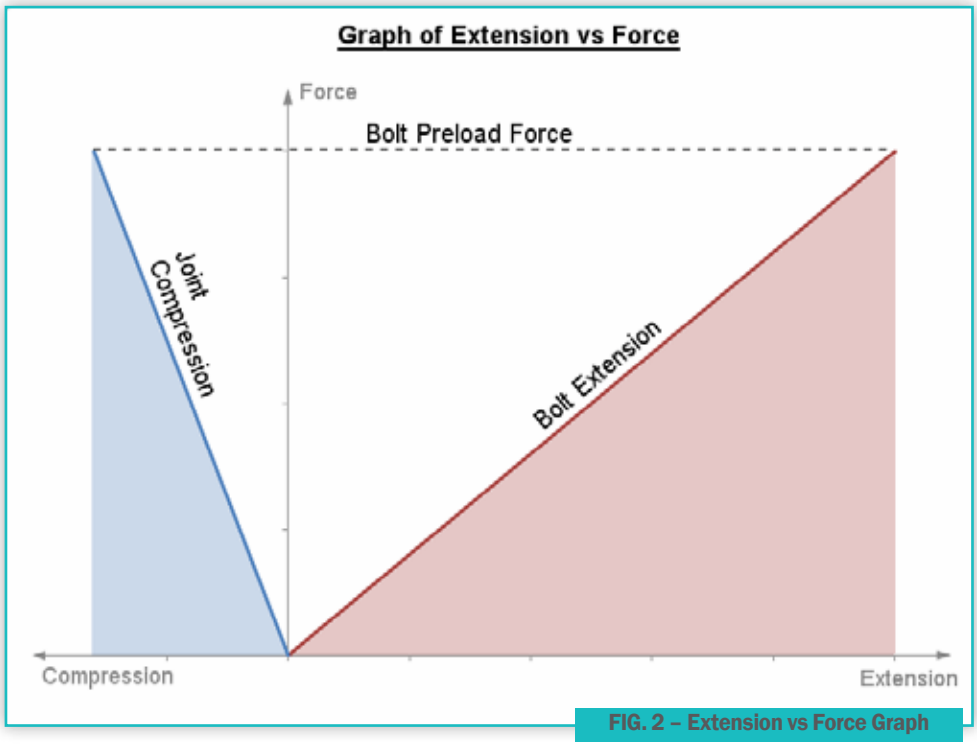
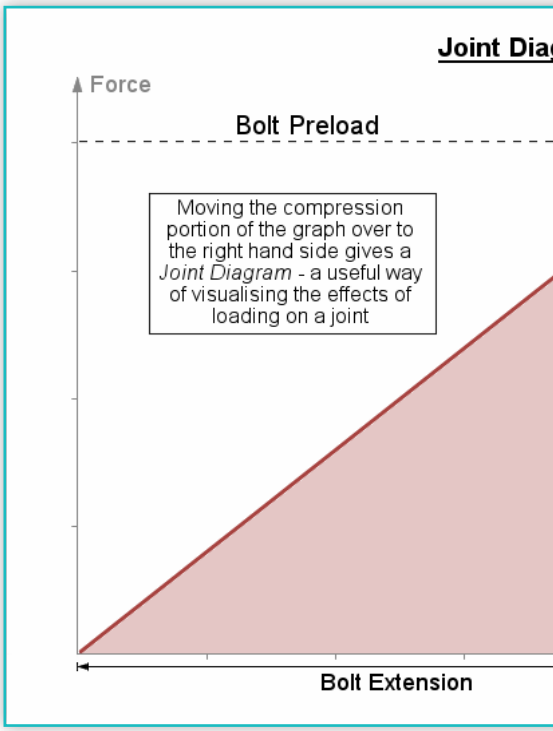


FIG. 2 – Extension vs Force Graph



If you now apply an external load to this system, it causes the bolt stretch to increase slightly, but it also relaxes the compressed joint material.

The compressed joint material is stiffer than the bolt so the majority of the applied load is taken up by a loss of clamping force, while only a small increase in bolt load occurs. Fig. 4 illustrates this and also highlights why high preload is a good thing; preload maximises the external load which can be applied before all the clamping force is lost and the joint separates. Most people would agree that bolt breakage constitutes joint failure, but joint separation is no less serious. Separation allows fluids to leak and parts to move relative to each other. The latter usually redistributes the load and bends fasteners, a problem often closely followed by them snapping off!

At this point I'm sure some of you are asking, "Hold on a moment. He just said the joint material is stiffer than the bolt, but steel is stiffer than aluminium, so surely for aeroplanes the bolt is usually stiffer then the joint?" It's true steel is stiffer than aluminium, but remember stiffness is a combination the material property (its modulus of elasticity) and the volume of material affected, so a steel bolt can be less stiff than the volume of aluminium it is clamping, especially if there is a washer to spread the clamping load over a larger area of aluminium (you do always use a washer don't you?).

GOING SOFT

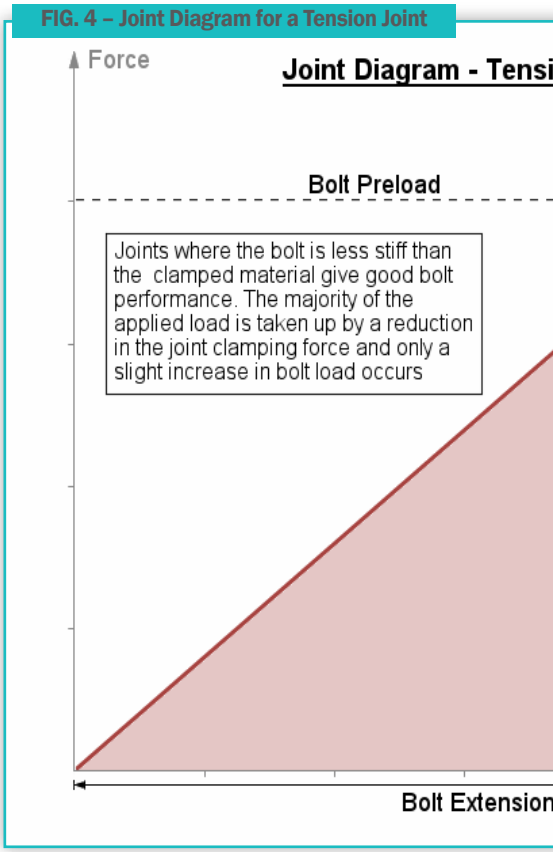
So what happens if your joint material is 'soft'? Assuming you can't just use a bigger washer (and you thought those big washers for wood structures were just there to stop the fibres crushing!), Fig. 5 shows the problems with a soft (low stiffness) joint material or an excessively stiff bolt. The bolt will carry much more of any applied load. This is great from a preload point of view because the loss of clamping force due to applied load will be much less, so you can get away with less preload. However you will need your bolt to be beefy or it will fail long before the joint separates and, of course, a beefy bolt will be even stiffer, further exacerbating the problem. Soft joints aren't a complete disaster, but they do need to be designed for.

CHASING PERFECTION

By now you have probably come to the conclusion that an ideal joint is extremely stiff with a very stretchy bolt torqued to just below its proof strength. You have also probably noticed there aren't many rubber bolts in the market, so it won't take much imagination to realise that chasing this ideal with real world materials is quite a challenge.

Real bolts are quite stiff, so you can't set the preload to just below the bolt's strength.

FIG. 4 – Joint Diagram for a Tension Joint



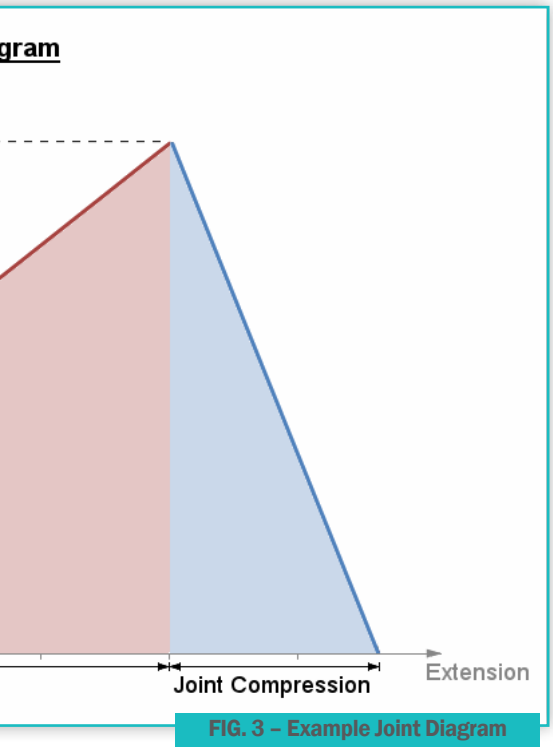
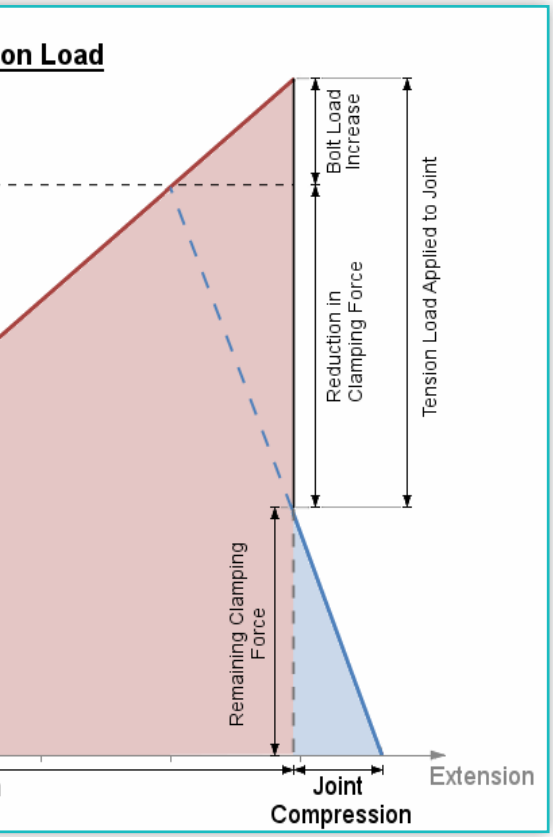


FIG. 3 – Example Joint Diagram



The bolt is always going to carry some of the applied load and you will need some margin of safety. In addition, the preload won't stay nicely fixed where you want it. Imagine the material being clamped is aluminium; the bolt is steel; the joint is thick; and there are significant temperature changes involved. Differential thermal expansion will have a huge impact, (just ask anyone who has designed through-bolts for an aluminium engine block) and achieving enough preload when cold, but not overstressing the bolts when hot, is going to be a challenge. Plus, if the bolt does get loaded beyond its yield strength, it will stretch permanently, so even if the bolt doesn't break, when the load is removed some of the clamping force will be lost; not ideal if you are using it to hold down a cylinder head.

SIT TIGHT

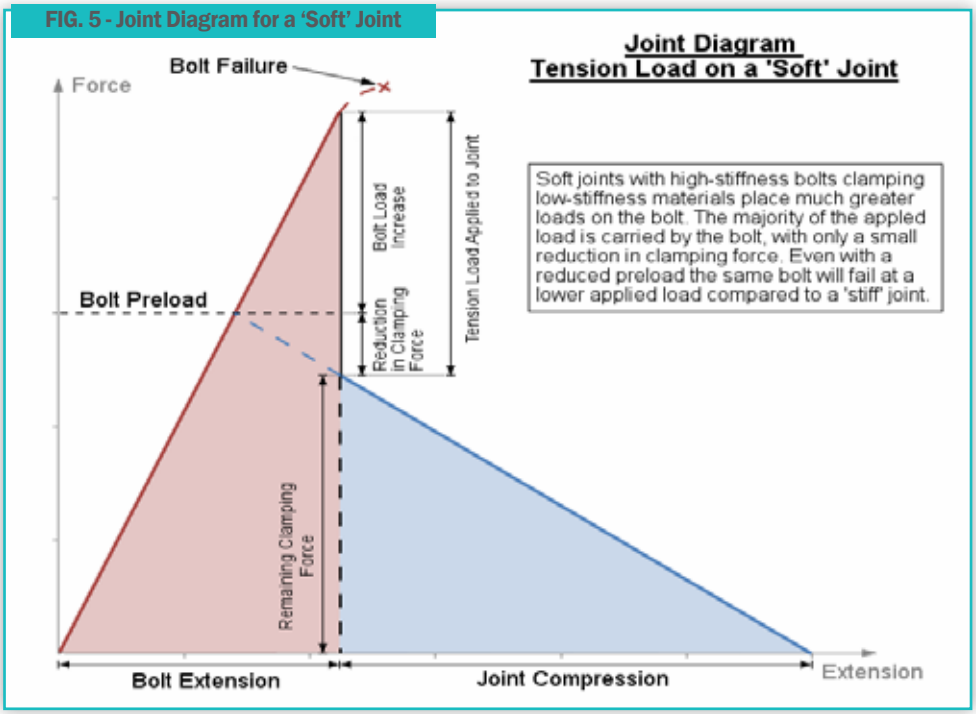
Let's assume you've got around the above problems and know exactly how much preload you want. Now you hit an even bigger problem: How do you actually get the desired preload? A calibrated and correctly used torque wrench, applied to a clean and within tolerance nut and bolt will give a preload accuracy of around ±25%. Yes, you read that correctly; if you do everything right you could still be out by a quarter of the intended value! Surface finish, coatings, contamination and lubricants can all massively affect the torque-preload relationship. So get some oil or other lubricant on a thread for example and you could easily break something long before reaching the specified torque; forget to include a washer and the increased friction from uneven bearing could result in inadequate preload and a joint which fails to develop its full strength. All this uncertainty inevitably leads to conservative design and it's a brave engineer who specifies a torque which will give a design preload above 85% of the bolt's rated proof load.

BACK IN THE REAL WORLD

This discussion has all been quite theoretical, but what are the implications for your average maintainer? If someone asked me what I thought was important when bolting something together, my first answer would be, "Don't forget the washers". These unassuming disks of metal are truly the unsung heroes of the fastening world (I'd have subjected you to an entire article on washers if I thought anyone would read it!). My second answer would be, "If a torque is specified, get your torque wrench and torque the nut correctly". Tightening by feel risks sacrificing some of the joint's strength and there aren't many joints in an aeroplane where you have that luxury. Finally, the strength of a joint is about far more than just the strength of the bolt - bolts should be always be replaced by bolts of the same grade, and while using a lower grade bolt is definitely bad, stronger certainly does not always mean better.

NEXT MONTH: Shear connections

FIG. 5 - Joint Diagram for a 'Soft' Joint



By gosh

THE BEST BITS ABOUT BUILDING YOUR OWN BY DAVE EDMUNDS

I have made a point in my regular column concerning the scale of the annual Oshkosh Airventure aviation week, and thought it might be a bit daunting to those who have not been. It doesn't have to be.

THE organisation within the town of Oshkosh and the organisation of the event as such, are astonishingly good. The Americans, as you would expect, are unfailingly helpful and friendly. It is also surprisingly good value. The atmosphere at the event is laid back and very different from the pretty awful scenes we see so often on TV.

The whole town is focused on the event for the week. Accommodation, except for student accommodation, should be booked early. That is why I am writing this now. Get in now for next year.

To get to Oshkosh, fly to Chicago. From Chicago, you can either get a bus or hire a car. I don't want a car when I am in Oshkosh, but some people seem to prefer it. The trip from Chicago to Oshkosh takes around five hours. The bus will drop you off at the university.

Student accommodation at the university is quite cheap. It is not luxurious. The rooms have two single beds and a bathroom down the corridor. They can be quite hot. You can request an upgrade to an air-conditioned room. The air-conditioner is stuck into a window which cannot open. In the small room, it makes some noise. The rooms also have a microwave and small fridge. You could go to the supermarket and buy a small fan. I have stayed there on both my visits. It is convenient.

For $20 you can get an Oshkosh-wide bus ticket. Buses leave from the university more or less continuously while there is demand in the morning and from the event more or less continuously for the university in the afternoon. If you ask nicely, the bus driver will stop and let you out near one of the supermarkets, from where you can catch the town bus back to the university.

Opposite the university accommodation there is a large cafeteria which serves buffet breakfasts and dinners for a very reasonable price. The food has the single virtue of leaving you no longer hungry. You won't enjoy it. They so serve wine and beer in the evening which can help. There are plenty of other eating options around town. My preference is to stop at the supermarket on the way home to get bread, cheese, salad, beer and the like. I sit outside in the courtyard on the warm summer evenings.

Similarly, you may be better off bringing food with you to the event. Many people carry small eskies. There are plenty of food outlets at the event, and the queues are not terrible. The food at the event is as bad as in town.

You can also camp at the event, many people do. One strategy is, on arrival, to go straight to Walmart and buy cheap camping gear and, when you are finished with it, leave it at Oshkosh. Be aware the weather during your visit is likely to be hot and steamy, with storms or showers very likely.

Hunt on the internet for nicer accommodation, but be aware that driving into the event every day, from somewhere not near the bus route, is considerably more hassle than catching the bus which seems to get some sort of priority and drops you more or less at the entrance.

It is more efficient to buy your entry tickets online before you leave Australia.

The event itself is always busy but never crowded. The vast majority of volunteers are overwhelmingly cheerful and helpful. The venue is astonishingly clean and tidy and a pleasure to enjoy. Don't forget a hat and dark glasses. Dress for hot weather.

On both occasions on which I have been, I have extended the trip to do some motorbike touring. You can pick up a rental bike in either Milwaukee or Chicago (I recommend Milwaukee). There is some very pretty countryside in this part of the US and it would be a shame to spend all that money to get there and not do a bit more. You can travel in the US quite cheaply and it is not really necessary to book ahead. Like all trips, it is a good idea to have at least some vague idea of where you want to go and why.

Oshkosh is a trip should be on the bucket list for anyone interested in aviation.

The bottom of the bath

THE BEST BITS ABOUT BUILDING YOUR OWN BY DAVE EDMUNDS

DURING WORLD WAR 2 BRITAIN RECRUITED A PARTICULAR BOFFIN, PROFESSOR C H WADDINGTON, AN EXPERT ON EPIGENETICS, TO ASSIST IN THE ANALYSIS OF THE SERVICE READINESS OF THE COASTAL COMMAND AIR FLEET.

The organisation was responsible for hunting submarines and destroying enemy shipping Professor Waddington found problems were occurring, particularly with aircraft returning to service after routine maintenance. He worked to restructure regular maintenance service so things that were not a problem were not fixed and, as a result, the time in service of aircraft was dramatically improved.

At the end of the war Professor Waddington went back to epigenetics.

It was not until the 1960s that his work was rediscovered by two US scientists who developed it into a maintenance framework called Reliability-Centred Maintenance.

Mike Busch a US entrepreneur, prolific writer and aviation engine guru, claims in his book '*Manifesto*' that reliability-centred maintenance is the foundation of virtually every area of aviation, with the sole exception of owner-operated general aviation. Much of this article is taken from his book 'Manifesto', available in both electronic and paper form from Amazon.

Reliability-centred maintenance relies on a few basic ideas. Any manufactured item may have flaws, no matter how good the quality control. The better the quality, the lower the probability of a flaw.

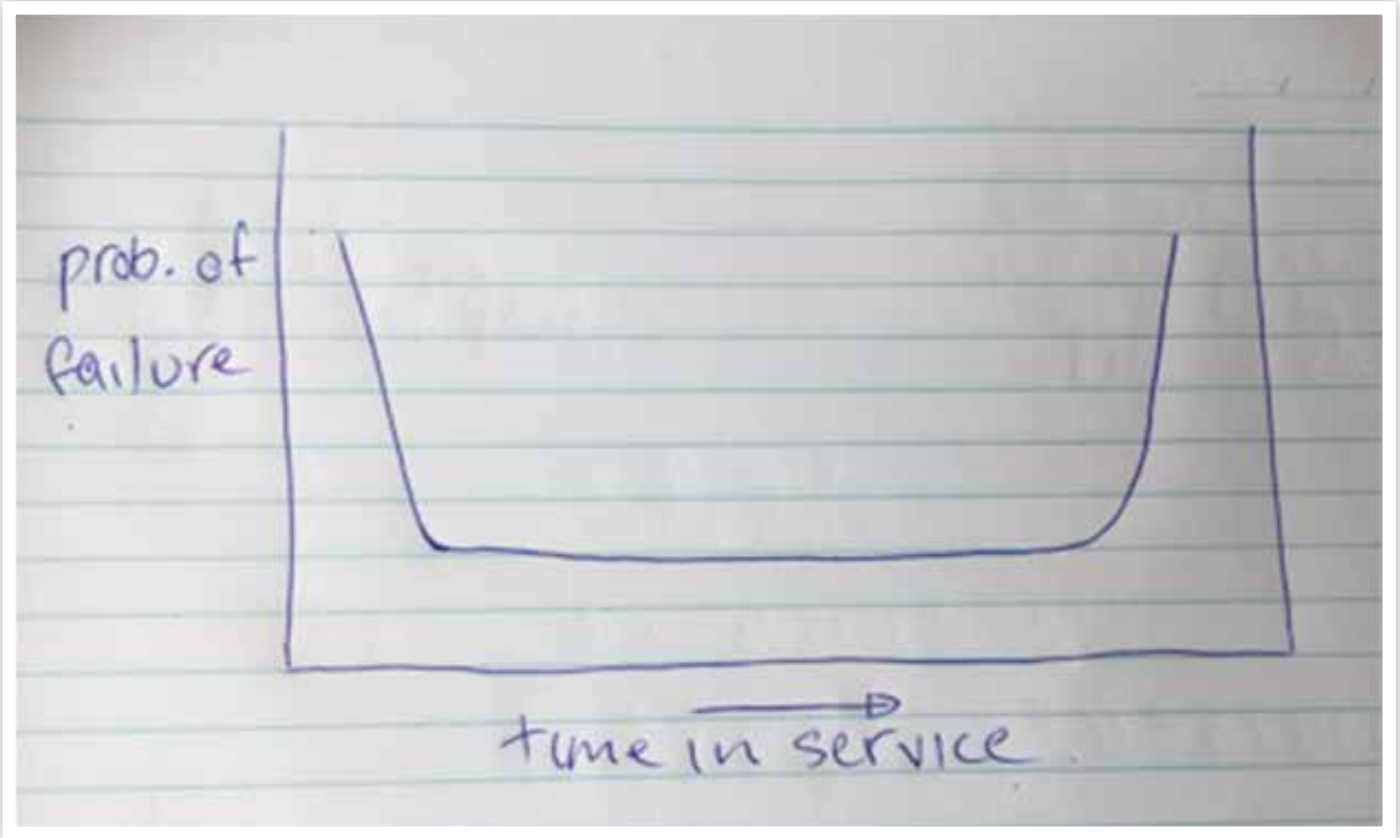
All mechanical items will wear over time. Any procedure which interferes with the operation of a device is a source of possible error and therefore failure.

The bathtub graph illustrates this problem.

So, the probability of failure is high when a device is new, or when it has been adjusted in service. If it survives its introduction to service, the probability of failure is low, until significant wear effects its operation.

If preventative maintenance is performed, the operation of the device slips back to the left hand end of the graph. Preventative maintenance has to be conceptually separated from routine maintenance on areas which have a clear lifetime, such as oil and filter changes.

Aircraft engine manufacturers specify a Time Before Overhaul and various parameters which also require an overhaul. The argument made by Mike Busch, and supported by the concept of reliability-centred maintenance, is that if the engine is operating well, and its operation is supported by a variety of non-intrusive data showing no imminent problem, then such time-defined maintenance is simply putting the engine back to the left hand end of the graph, when it has been happily operating along the bottom of the bathtub.



That is, the probability of failure is increased by such intervention.

Mike Busch suggests that the better, and much cheaper, course of action is to run the engine on condition.

A specific example is a leak down test. This is a routine procedure where compressed air is fed via a regulator, typically set to 80psi, into a cylinder through an adaptor fitted to a spark plug hole. The pressure the cylinder can hold is then monitored.

Manufacturers specify a minimum pressure that the cylinder should maintain. The procedure indicates both cylinder wear and possible valve seating problems. If a valve problem is identified, the cylinder head must be removed and the problem fixed.

However, if the cylinder is not coming up to specification, that is, it is showing some wear, but the engine is operating well, then there is probably no need to intervene. The engine may be approaching the right hand end of the bathtub graph, but is not there yet. Intervention at this stage will place the engine at the high probability of a problem at the left hand end of the graph.

The proviso here is that such a deviation from the manufacturer's recommendation must rely on meticulous data collection. Mike Busch suggests that, at every oil change, a sample of the used oil is sent off for analysis. Such analysis would show whether the engine was 'making metal', what sort of metal and therefore the source of an imminent problem. He believes engine instrumentation which includes saved data is essential. At a minimum this should include all cylinder head and exhaust gas temperatures. His book includes examples of diagnoses based on such data. The key here is that the acquisition of such data must be non-intrusive.

As it happens I wrote in an early article about my project to design and construct such an instrument. It turns out to be a bit harder than expected because of the interference of the aircraft systems with the tiny signals produced by thermocouples. Most of these problems have now been solved, and it works just perfectly on my workbench, just not in my plane yet. This will be the subject of another article.

As an entrepreneur, Mike Busch has set up an online service to upload engine data and provide an analysis. Google the word 'Savvy'.

Liability is a problem. Any mechanic who decides to service an owner's plane without strict regard to the manufacturer's schedules is unlikely to last long, even though such maintenance may be sub-optimal.

Mike Busch suggests, optimistically, that it is up to the owner of the aircraft to decide what has to be done, based on information provided by the mechanic. It is obvious if things go wrong this system can come undone. Nevertheless, it is what I actually do with the mechanic who looks after my plane. I trust him, but make it clear I am responsible.

So although this article describes theory, it is not a recommendation for any particular action, and may even cut across an aircraft owner's obligations. Even so it should be obvious I am attracted to the theory.

Mike Busch is an engaging speaker and presented six seminars at Oshkosh this year, all free except for the weekly pass to the whole event.

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At the heart of the 360fly 4K is a powerful new 16-megapixel image sensor which increases resolution to 2,880x2,880 pixels - with no seaming or stitching. 360fly 4K is water resistant, dustproof, shockproof and has a non-slip/soft-touch coating. New features include Motion/Audio Activate, Time-Lapse Mode, First-Person POV Mode, built-in gyroscope, non-assisted GPS, 64 GB internal memory, and full 360° Live Stream via the free app.

- **PRICE** HD version $499.95 4K Version $849.95
- **WEB** 360fly.com

NOT IN EVERYONE'S PRICE BRACKET

BRX-1 WATCH

The luxury Bell and Ross watches are not in everyone's price bracket, but hey, it's nearly Christmas. The BRX-1 is limited to just 250 pieces so you probably won't get one anyway. It is a mechanical timepiece with 56 jewels. It shows hours, minutes, seconds, date and timer. It's made of Titanium and anodised blue aluminium with rubber inserts. Rocker push-buttons. Back with opening in tinted sapphire crystal, centred on the balance. Water resistant to 100 metres. The strap is alligator (of course) and grey rubber.

- **PRICE** USD$19,990.00 (gasp)
- **WEB** bellandross.com

SATELLITE COMMUNICATOR

The Delorme InReach Explorer allows you to send and receive text messages, trigger an SOS for help and track your GPS coordinates, wherever your trip takes you. It keeps you connected when off the grid and outside mobile phone range. It also allows you to share your journey and experiences with friends and family and gives them peace of mind knowing they can contact you.

Allows for adjustable tracking intervals and includes GPS coordinates, course, elevation and speed. Pair with mobile devices using the app. Delivery confirmation for text messages and SOS signals. 100% global coverage through the Iridium satellite network with no gaps, fringe or weak signal areas.

- **SATELLITE SUBSCRIPTION** From USD$12.00
- **PRICE** USD$379.95
- **WEB** www.delorme.com

PHOTO/VIDEO RIG

Grip and Shoot fits in your pocket. Great for taking photos one handed and while moving. Place the phone camera up to 30m away for remote photos or video. Excellent for flight training and joy flight operators. Mount the camera and use the grip to remotely take video or pictures. Hand-held stabiliser, remote control and tripod mount.

- **PRICE** $170.00
- **WEB** www.skyshop.com.au

Kaddie and John with Scott McLachlan

WHERE IS CAGIT?

CAGIT BOUNCES AROUND

As forecast in previous editions of *Sport Pilot*, the Come and Get It Trophy didn't stay long at Moruya on the NSW south coast.

On September 24 John Crosby and his daughter Kaddie, swooped down on Scott McLachlan's home base, scooped up the trophy and winged it to NSW, where it was set up in all its glory at Sharron Park Farmstay B & B at Glencoe.

John and Kaddie had flown a trip of 868nm in 13.6hrs in John's Hornet to make the heist, an admirable adventure, but it was all for naught.

Just one week later West Australian CAGIT trophy hunters pounced on Glencoe.

David and Jen Ford were on the east coast for Oz-Kosh in their Brumby 610. Taking their opportunity, they went a little bit further, lifted the trophy from Glencoe, took it back to Narromine and then to Esperance where it will no doubt bounce around the west coast for a while.

After its long sojourn in the Northern Territory, CAGIT has chalked up a lot of air miles in the past few months.

If you or your crew are contemplating a high speed heist of recreational aviation's most coveted prize, its best to keep up-to-date with its latest location by checking the CAGIT Hunters Facebook page, administered by Dexter Burkill, Peter Zweck & David Carroll www.facebook.com/CagitHunters/.

ADVERTISERS INDEX

One last flight?

BY GARRY MAJOR

I live in Kyabram, in Northern Victoria and am 72 years old. As a young boy I was always interested in aircraft and had the desire to get my pilot's licence. But the cost involved seemed beyond me.

One day I read an article about an Aerochute and in 2007 I took a Trial Instructional Flight with Andy at Werribee. Two weeks later I had my first flying lesson and a few weeks after that, I flew solo for the first time. It was a wonderful feeling, and one which I enjoy every time I fly.

I bought my own Aerochute the following year and now have a passenger endorsement and low level endorsement on my Pilot's Certificate.

In January 2014, I was diagnosed with bone cancer in my pelvis and vertebrae. This has progressively curtailed my flying time. In the first nine months of this year, I was only able to fly 11 times.

There was a gap of four months between my most recent flights, but the feeling at the end of my last flight was exhilarating. My family told me I was smiling all over when I landed.

I hope I can fly it again one day.

Godspeed Garry from every one of your fellow pilots in RAAus.

SEND IN YOUR STORIES

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

BERT FLOOD IMPORTS

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914 F/UL | 115hp

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912 A/F/UL | 80hp

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