



Recreational Pilot - Issue #27
October 2006



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Front cover top - Craig Gilbert

Front cover bottom and all of the back cover - Brent Thompson

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MICROLIGHT SERVICING IS LIKE SAFE SEX

Grant Gilbert Te Puke

Always check your rubbers

I had been looking around (as you do) for a while for a Quicksilver MXL II Sport and finally found one in Kaipara Flats, an hour north of Auckland. It turned out to be a machine I had previously seen back in the early 90s. At that time I owned an MX & the Hood brothers turned up at Tauranga airport in this really sexy MXL II with a 582 mounted up the top and a beautiful warp drive prop. I thought to myself, one day I would have a machine like that.

After a few phone calls and a trip up north to check things out, the deal was done. My very good mates, Lionel and Dot Reeve were good enough to come on the retrieval mission with me and luckily they did.

We headed up to Kaipara on Sunday & arrived at around 2:30 pm. The idea was to fly the machine off the Hood brother's farm strip and fly it down to the Kaipara Flat's strip. We arrived and inspected the machine and found the engine "running like a dog". Good O'l Lionel was into the thing boots and all with a screw driver and found the needle in one of the carbs was inserted wrong. We fixed this and finally we were off. I flew it down to the Kaipara strip and she ran well. I thought to myself while in the air, this is wicked. I remember why I just love the feeling of flying an open machine.

I did a couple of circuits just to make sure all was ok. Lionel then did a couple and I will never forget the huge smile on his face when he had landed. He had tears streaming from his eyes because of the wind behind his glasses and couldn't see a thing due to the sun but he was buzzing. "real microlight flying"

We tied it down for the night and retired to a motel in Warkworth with the intention for me to fly(at 6.30am.) back to Tauranga the next day.

We got up the following morning at some ungodly hour (4 am.)in the dark and it was bloody freezing with ice everywhere. It all of a sudden hit me, What the hell am I doing flying a machine all that way without really knowing it's history. I could tell ya, I was as nervous as hell but it had to be done. We headed off to the strip at about 6:00 am , on the way, I ran into a duck with my car and bowled it for a six. At that moment, I thought, This is not good but didn't say anything. We arrived at the strip to find the machine had a dam flat tyre so off came the wheel, Lionel found a small metal filing embedded in the inner tyre. In went a new tube (luckily we had a spare) and after a trip to Warkworth to blow it up, back to the strip and we were good to go. We loaded two 20 litre containers of fuel in the spare seat & connected the refueling system and spent the next 10 minutes trying to start it.

Once we got it running (8.30 am.)and all the checks done, I lined up and took to the sky. I climbed out to a beautiful, calm sunny sky and headed to the Waitakarie coast to the west of Auckland. I climbed to 1500 feet , it felt fantastic, I could feel the cool breeze on my face and smell the smoke from the fire places in the homes below. I got to the coast and decided to track out to sea abit and stay down below 1000 feet. I looked at all the bush and thought to myself, If I went down in there, I would be wild pig tucker for sure. I was having a fantastic flight, I tracked across the Auckland harbour entrance and continued down the coast a way to miss the CTR. I then climbed and headed for Mercer. We had called into Mercer on the way up in the car to check it out and found the runway to be just a bog hole due to all the rain but luckily they have a fantastic sealed taxi way but she's a bit rough in places. I landed there and waited for Lionel & Dot who were driving my car back. Mercer is an interesting strip. It's used mainly for Sky diving.

After a cup of coffee & a cake, I headed for Waihi. As i was flying towards the marshes across the Waikato, a warning light came on, on the Flydat, It appeared the EGT's were a bit high

then suddenly, I lost engine power, I pulled the throttle back and it came right, a minute later it did the same thing. Ok I thought, I have to find a paddock, I remember thinking, I need a paddock close to the main road with access and no power lines. I chose one it looked good and put her down. When the wheels touched, I thought, wow, this is smooth for a farm paddock then all of a sudden, wooomffff. I came to a grinding halt with mud from the tips of my toes to the top of the fuel tank. I looked like one of those guys that drive those serious 4 wheel machines. I got out and checked my new baby. All was good, no damage apart from having the wheels up to the axles in mud.



I was standing there thinking, what the hell now. A guy stopped on the main road and came over. It turned out he had a B22 at Matamata and asked if he could help. We pulled the machine from the mud to higher ground near a gate which was bloody hard yacker I can tell ya. I rang Lionel and Dot on the cellphone, they arrived after a while. After a brief discussion we decided to take the MXL to bits and take it back to Tauranga in a trailer. I called another mate, Rob Sanders who thankfully could bring over a big covered in trailer.

We started taking her to bits which I must say, is a very simple job but time consuming especially in the mud not to mention the cow S?/@# and puddles. Rob turned up after a couple of hours and we loaded my baby into the trailer with lots of padding and deliberation. Now this is a bloody long and wide trailer, the next mission was to park Rob's car on the side of the road and to push the trailer out of the gateway to the paddock onto the road to line up with the towbar. At this point, Lionel and Rob decided to check the lights on the trailer and the coupling of the trailer to the car got forgotten (it was sitting on top of the ball). I did up the safety chain but we all thought each other had connected the trailer, well you can imagine what happened next. We headed off down the road about 500 meters when all of a sudden there was a big bang, the car jerked forward and backwards. Rob turned to me with a very stressed look on his face and said "The trailer has fallen off" My instant thought was, what the hell else can go wrong today!. But at least the 40 tonne truck and trailer behind us stopped okay.



There we were in the middle of the highway on a bridge, stopped with trucks and cars backed up behind us. I jumped out and tried to lift the trailer back on the ball, I managed to lift it about two inches then dropped it on my big toe. I started yelling at Rob to come and help. He jumped out and between us we put it back on with a lot of stress, a sore big toe and pulled muscles in my back.

We then headed for Tauranga. All the way home I was wondering what else was going to happen but all was good. We made it back with no other issues.

The main fault with the engine was the pulse line between the crankcase and the fuel pump was cracked. Actually on closer inspection, we found most of the rubbers to be bugged. This machine was recently given a permit to fly so I have some strong thoughts about this process as you can imagine.

When you find mates who fly microlights with you, You have true mates for life and I really want to thank Lionel, Dot, Rob & Bob whose trailer we borrowed for all the effort. Cheers guys.

From Charles Russell

Reading about the adventures of the guys down South makes me feel jealous. All the flying we do around here seems to be either maintenance flights or pounding the circuit.

A while back I watched a helicopter come in minutes before the weather packed a big time sad. The young Spanish pilot and his wife were doing some exploring while he built hours for his Commercial Licence. I took them home for the night to sleep on the floor (my accommodation being somewhat primitive at the time), but they were cheerful enough. The next day we went out to the field to gas up for their trip back to Ardmore. He asked me if I would like a run round the field before going over to the pump. What a silly question! He stood looking at a couple of scorch marks in the sodden grass, as I made myself comfortable in the pax seat. Helicopters have been described as whores (no visible means of support), and having done a half hour in one previously, that weird feeling of having no wings came back to me. As we climbed out I casually asked him to show me an autorotation. This produced a reluctant declining since these things are not for the faint-hearted. He obviously thought about it afterwards and decided he was being silly. If a manoeuvre is scary, as a pilot you don't understand it. He decided to demonstrate it to me, and announced this as we were half way down wind. We then climbed out to 1500 feet, turned base to final, and he pulled the power. Down we went at 1000 feet a second without a great deal of forward motion. He was really concentrating, I was enjoying the image of the ground swelling rapidly and the instruments frantically doing their thing. (God, in our ignorance how we trust others!) About halfway down he said to me 'If my wife was in your seat now she would be screaming her head off'. I could see nothing wrong with our progress, gravitation was doing its thing, the rotors were spinning nicely above us, and we had the inertia to roll out of our dive into a graceful round-out and sledge across the wet grass to a dignified conclusion. He pulled the pin a hundred feet above the runway, which I think would take more skill than simply letting it happen, and we climbed away. At the pumps discussing this, I told him that those kinds of approaches were what I was accustomed to in our trusty old Bantam. This was before all those exotic 4 strokes got hung on the tube, making them so nose-heavy, a stall cannot occur, pulling the power now simply makes you fall out of the sky with all the characteristics of a wall brick.

Learning to fly in my day, we did circuits at 500 feet, since anything higher would have taken all day. At the downwind end, power came off and you were on the runway several seconds later. It was a steep learning curve and my instructor uncompromising. As you evolve into an old fart, you get like that. Experiencing a complete engine failure at 800 feet after 37 hours total time, I was taken aback at the lack of time I had available to get down in one piece.

The early Bantams were interesting. 2 stroke engines screaming away at absurdly high revs, the knowledge that it could go quiet at anytime and one eye always looking down for a suitable landing site. Any aspiring helicopter pilot should do some hours in an early Bantam. Engine failure? Power loss? Not a problem. That paddock I have been checking out for the past 3 minutes will do very nicely. When a pilot moves on to bigger things, those early experiences can mean the difference between a controlled descent and a very painful arrival.

Recreational Aircraft Association of New Zealand



Some facts and information.

RAANZ , originally MAANZ (Microlight Aircraft Association of New Zealand) was formed in the early 80's by people who had imported the new light weight aircraft, the microlight.

From the earliest days RAANZ has been involved with The Department of Transport, Air Ministry and in more recent times CAA. The involvement with the regulator and acceptance of delegated responsibility for Microlight Aircraft and their pilots is why RAANZ exists. RAANZ has an open and productive relationship with CAA but are mindful that we need to keep our sport accessible and not cluttered with unnecessary regulation and complicated compliance. RAANZ attends regular MOU meetings with CAA to ensure your voice is heard.

Who owns RAANZ? Its members. RAANZ is an incorporated society and have an elected committee who in turn elect a President and Vice President. The committee appoints a part time administrator, a Technical Officer and AN Operations Officer. You can read more about our structure by viewing our constitution which is on our web site. Any member of RAANZ can stand for a position on the national executive and we welcome nominations from throughout NZ.

Is RAANZ responsible for running clubs? No. RAANZ is an umbrella organisation that caters for its members in conjunction with their clubs. RAANZ provides its members with services and representation that are not practical to deliver at a local level. Clubs are run at a local level.

What does RAANZ get involved with at a local level? RAANZ provides all of the back office services required by its members. These services must be run in a way that complies with our PART 149 exposition and caters for our member's needs. RAANZ is responsible for the efficient operation and appropriate standards of the Instructor and Inspection Authority networks. The central organisation is involved in the appointment of both IA's and ATO's. RAANZ will also become involved with any issues that are raised from the clubs or CAA about operational or technical matters.

In addition to the obvious services we provide we are constantly undertaking projects that support what we do for our members. Currently we are reviewing the training manual with the help of our ATO network. We held a most productive ATO conference last year and the current round of IA workshops and the Resource CD for IA's are proving most valuable, In fact, the new IA resource CD is probably the best single resource on this topic available anywhere. The list of projects that RAANZ and MAANZ have been involved with date back to our beginnings and project into our future.

RAANZ'S mission is to provide support to microlight pilots, promote best practice with the minimum of fuss and do this at an affordable price. RAANZ fees have been set at \$65 per year for nearly a decade and for that price members receive all of our back office services and our quarterly magazine. That's value! Exams, pilot licensing, processing of inspections, processing of aircraft modifications, regularly published information to members, and national representation for one low annual fee.

RAANZ is the only Microlight Organisation that publishes a members magazine specifically for microlight pilots. Recreational Pilot contains information about what RAANZ is up to, keeping members in the loop, as well as useful technical articles and any stories or articles submitted by members. We can make this magazine even better if we have more contributions from you, our members. It is your magazine. There is space in the next issue for your article. Go for it!

RAANZ's membership has been steadily growing for several years and our members are overwhelmingly positive and supportive. RAANZ is continually looking for ways to help better serve our members, if you have any thoughts, feedback or concerns you would like to raise contact RAANZ directly or through your Club's committee.

You can find out more about anything to do with RAANZ by talking to experienced RAANZ members, looking on our web site or talking to one of our executive.

Never too young

Not long ago I told you about Josh Hartley, who had come along to learn to fly our Tecnam Golf microlight at the Bay of Islands Aero Club when he was still only 14. Being too young to send solo, we nevertheless decided to work towards have him achieve this on his 16th birthday and RAANZ supported him with a complimentary Flight Instruction Manual, and a logbook.



Recently Josh moved to become a boarder at New Plymouth Boys High School, but continued his flying lessons at the New Plymouth Aero Club, graduating from a microlight to a Cessna aircraft, which he finally got to fly alone on his 16th birthday on 20th August, incidentally becoming New Zealand's youngest pilot at the same time.

Although we 'lost' his First Solo to another aero club, we are proud to have started Josh on his chosen career in aviation, the Boeing 747 is still a few steps away, but he has taken the first one ! Congratulations Josh.

Alan Murgatroyd, RAANZ S/ Instructor, Bay of Islands Aero Club Kerikeri.

If you have concerns with a pilot or aircraft operations you encounter:

Clearly state your concerns to the people directly affected and hear what they have to say.

Discuss the matter with people whose experience and judgement you respect.

Evaluate all new information and re-assess your concern.

Offer constructive advice if you think that it will make the situation better.

Everyone has an obligation to resolve concerns that endanger people and aircraft operations.

It is never just one person or someone else's job. It is our collective responsibility.

From the boiler room.....

a.. Hang on to your Medical declaration. A number of people are sending in their medical declarations with the CMV forms. I don't need to see them- your instructor does. Keep your current medical in your logbook so your instructor can sight at renewal time.

b.. Check your RAANZ membership. Remember that to be a legal pilot your RAANZ membership must be current. Also you must be within 3 months of current for your vote to count at the AGM. Check your membership expiry date on the RecPilot wrapper. If you don't receive a personal copy of this magazine, chances are your membership has expired.

c.. New Medical and Fit and Proper forms. The old HTML forms off the RAANZ website were formatted for viewing rather than printing- sometimes requiring 3 A4 sheets to print. We have reformatted these forms for tidier printout. They are available off the website in PDF form.

d.. RAANZ mailing address. Instructors and IAs- remember the address printed on the VMV and Flight Permit/Validation forms is out of date. Please mark up the correct address somewhere on your pad so you don't forget. RAANZ Inc, Freepost 102829, PO Box 15-016, Dinsdale 3243, Hamilton.

e.. Flight permit/Validation forms. IAs, remember to send in the pink copies to me to file and record on our database. This is to make sure our records match reality, so when CAA ring asking if a particular aircraft is legal, I can confirm with certainty.

Some interesting facts from our database.....

- a.. Current membership - 745
- b.. Current aircraft - 239 (but database is incomplete)
- c.. Oldest pilot - 87 (and still flying)
- d.. Youngest pilot - 13 (in training- 3 years till solo!)
- e.. Highest hours- 32896 (but not all in microlights!)
- f.. The big 5 clubs- CRAC (90), BOPMA (69), SRAC (63), NRFC (55), SCMC (41)

See you at the AGM. Stuart Parker RAANZ Admin



PO Box 15-016, Dinsdale, Hamilton.



From RAANZ members.

News, Stories, Photos, New Letters,

Events, Poems, Jingles and Rude songs.

Send it to:

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From the NRFC June News letter - by Bert Gregory - Chief Flying Instructor

Fuel Management / Mismanagement: one of the biggest causes of Incidents / Accidents. Between 1995 and 2001, there were 22 accidents involving fuel starvation resulting in 13 fatalities and 10 serious injuries. The reasons ? All involve Pilot Error:

- a) **Inadequate fuel system knowledge – you need to know the following:**
 - the correct fuel grade for your aircraft
 - the total capacity of the aircraft – how much is usable and unusable
 - where the fuel drain point(s) are located
 - fuel selector operation
 - cross feeding procedures
 - when to use the electric-driven fuel pump
 - normal fuel pressure readings
 - different consumption rates for different altitudes / rpm's
 - the manifold pressure and rpm for best range

- b) **Lack of adequate pre-flight planning:**
 - under estimating fuel required to conclude a flight safely
 - failure to allow for the proper reserves – day VFR operations require a minimum of a 30 minute reserve
 - failing to build in a contingency allowance – you may have stronger headwinds than forecast, the actual fuel consumption may be higher than the “book” says owing to the age of the engine, the condition of the prop etc. A prudent contingency allowance is an extra 10 %
 - taking less than minimum fuel to maximize luggage uplift
 - failure to plan some alternative re-fueling points along the route
 - failure to plan an alternate destination to cover the situation where proceeding to the planned destination becomes impossible due weather

- c) **Sloppy pre-flight checks:**
 - failure to dip the tanks: particularly after an overnight stop (fuel theft is an increasing problem with the ever-increasing cost of Avgas)
 - failure to drain the water off through the fuel drains
 - relying on somebody else's confirmation of your fuel state – you are the PIC – it's your responsibility to check the fuel yourself
 - failing to complete the pre-take-off checks properly – departing with the wrong tank(s) selected

- d) **Poor performance in flight:**
 - failing to accurately monitor in-flight fuel consumption – you need to keep an accurate in-flight fuel management log
 - failure to fly the aircraft as planned – an extra 100 rpm can increase fuel consumption on an aircraft with a fixed-pitch propeller by 10 %
 - failure to lean the engine correctly – thankfully not a problem with most microlight aircraft engines
 - flying the aircraft out of trim – keep that ball in the middle...
 - assuming fuel gauges are accurate – you may have less fuel than the gauges indicate
 - finger trouble – making mistakes when switching tanks. This results in things going very quiet.
 - pressing on when things are not looking too good rather than diverting early and refueling
 - failure to carry out a precautionary landing - if its obvious that you are going to run out of fuel, it is better to make a precautionary landing before the engine quits

Wanaka trip - Stan Hyde

This journey all started with a chap from Rangiora who wanted to buy my Jabiru right or wrong . He soon worked out that not only would his offer have to be good but he would have to find a replacement plane that was more suited to my needs which is exactly what he did. He contacted me and talked about a 601 Zenair

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Zodiac with low hour and tricycle undercarriage. Would I consider this aircraft so he could have the Jabiru?

Two weeks later after a lot of thought I agreed. It was based at Wanaka on a private strip, how to get it back was the next question. I talked to Bill about ratings etc and asked him if he would accompany me to Wanaka and fly it home. Without hesitation he agreed to help. All relied on the weather and when the conditions looked good we booked air NZ to Wanaka. We were greeted by the owner's daughter-in - law and grand daughter who took us to the plane. I had an aircraft lame from Wanaka check and service the 601 and all we had to do was push the start button and go. Not! The radio had been left on and the battery was dead flat. Luckily they had jumper leads in the car.

Two hours later than expected we were on our way. Bill sat in the left set for this leg and I shared the flying. The weather was kind to us as we flew through the Lindis and Burke Passes and on to our first stop at Rangiora. All went according to plan and the plane went well. We got the usual warm welcome, plane hangared and the use of Ross Marfell's car, then a few beers with the lads before settling down in the clubrooms for the night.

We woke on Thursday to low cloud and showers which cleared enough by one O'clock to leave. I flew left seat on this leg but with the low cloud and poor visibility we were both working fairly hard to ensure a safe flight ahead but still having a clear track to turn back. Out of the murk to our left at exactly the same height another plane appeared, passed us and disappeared into the cloud ahead. Quite scary when you think we were both flying in the same direction in the same place at the same height and in conditions that were borderline. He landed at Kaikoura and we continued on home. After Kaikoura conditions improved and we had a perfect strait crossing at 2000 ft. We met up with Peter Kernhohan just after Paraparaumu and he accompanied us back to Feilding. We took 2 hours 50 minutes from Rangiora to Feilding, a new record for me and an excellent trip.

Thanks Bill.



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RC Short circuit protection	Yes	✓
Cable connectors	Yes	✓

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Jabiru Flywheel Bolts Important Notice. **Anton Lawrence RAANZ Tech Officer**



Over the last couple of years there has been an increasing awareness of a problem with the flywheel retaining bolts in the Jabiru 2200 and 3300 engine. The problem is simple enough to identify, the bolts are breaking and have caused in-flight engine failure. The cause has been much harder to identify and has been blamed on loose prop and prop extension bolts. There can be no question that loose bolts in this area will transfer harmonic vibrations down the crank and precipitate movement of the flywheel parts. Examination of the timing gear on engines with broken bolts has identified severe fretting of the gear against the end of the crank, this cyclic movement is the reason the bolts are breaking. The retaining bolts are 5/16th socket cap screws property class 12.9, although some of these are threaded full length, which wouldn't normally be considered best practice, all the bolts are fracturing on the shear line.

12.9 bolts have an ultimate tensile strength of 1220 MPa and yield strength of 1100 MPa, it is normal to tighten these to within 90% of yield; this is to ensure proper clamp pressure of the parts. This would cause the Jabiru bolts to elongate by about 5 thou and is the mechanism by which clamp pressure is maintained.

A company in Hamilton, Assesco has analysed this joint and come up with a torque figure of 41Nm for these bolts with lubricated threads and washer face. I have used the formula from MIL-HDBK-60 and come up with a figure of 43Nm using the same lubrication and 56Nm with no lubrication. The Jabiru manual states a figure of 24Nm for these bolts with out lubrication, it is my belief that this where the problem partly lies. (Jabiru apparently now recommend 32Nm but this is still only ½ the maximum preload the bolts can take.)

The CAA is working on an AD for these engines which will most likely require the bolts to be replaced every 100hrs. It is very important that as part of the replacement procedure the timing gear is removed and inspected, if there is any sign of fretting the part should be replaced and equally important is that the bolts are replaced irrespective of their appearance.

Jabiru are now fitting three 1/4inch dowels into the end of the crank in an attempt to prevent this fretting, any new gear will have holes for these dowels pre drilled. The fitting of the dowels into the crank is a very precise job and should not be attempted by anyone other than a qualified fitter, engineer or toolmaker. Assesco is one company which has already completed ten of these dowel fitting operations, I don't want this article to appear to be advert for one company or an other, so if you want their contact details you can contact me directly and I will pass them on to you.

In conclusion, if you have an unmodified Jabiru engine of either type in any aircraft type you should immediately have the flywheel bolts and timing gear inspected, if all looks OK you should replace the bolts (reminder, 12.9 bolts should never be reused) and tighten them to between 41Nm to 43Nm using molybdenum grease as a lubricant in the threads and under the head, don't get any grease on the bearing surfaces. If you use Loctite 620 in the threads and grease under the head you should tighten to 46Nm, Loctite 620 and no grease tighten to 53Nm.

If you are going to tighten these bolts to the above figures it is vital the bolt has a ½" diameter minimum hardened washer under the head, if not the bolt will embed into the alloy parts and preload will be lost.

Check the prop bolts and prop extension bolts for correct tightening and also check to ensure the extension is running true and the tracking is within 3mm, on some aircraft these have been found to be well off centre. If you have 10mm prop flange extension cap screws installed with Loctite 620, you can take them to 89Nm to reach 90% of yield.

I have also checked the torque for the Crankshaft Prop Flange Cap Screws as these have also been found slightly loose, Jabiru recommends 40Nm but these bolts are capable of taking 83Nm.

If all these bolts are tightened correctly and all the parts are running true it should be possible to eliminate the problem of broken bolts.

When tightening bolts you should tighten to half the required amount following the tightening sequence, leave for an hour (no longer if using Loctite 620) to allow for local relaxation and then complete the tightening in one movement so as not to get stuck with static friction at a lower level, I have calculated the turn of the nut (5/16 cap screw) from snug tight to 43Nm be only 48deg so take care.

Some notes on Loctite:

Jabiru has apparently changed their recommendation of Loctite 262 to 620 for the above parts. 620 is not specified as a thread lock product but Loctite assure me it is good for the job as it has a longer time before cure and higher temperature capabilities. You can download all the data sheets from <http://www.loctite.co.nz>. Unfortunately you won't find the friction coefficients or nut factors on these sheets, I have had to dig deeper to get these directly from Loctite.

If you would like to discuss any aspect of this article or require further explanation please contact: Anton Lawrence tech@raanz.org.nz

Nut and Bolt locking devices

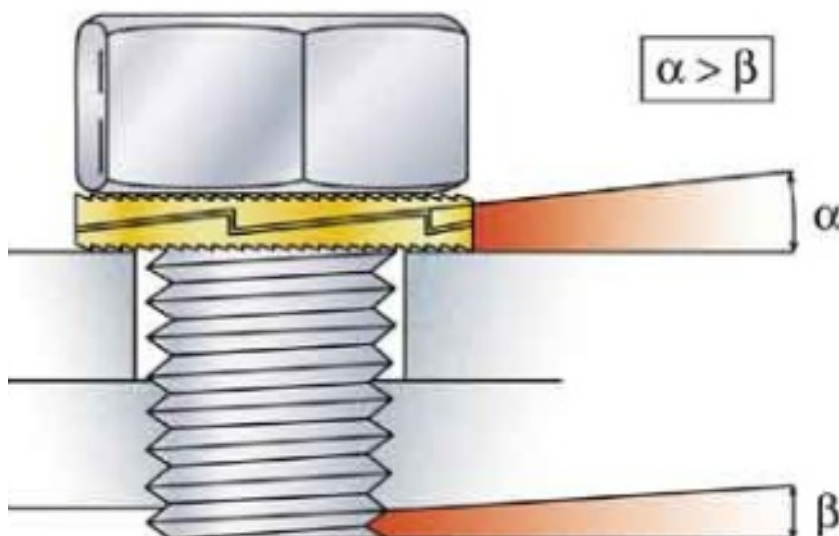
Anton Lawrence



While doing research into bolt types I came across several new types of locking systems and found some interesting facts regarding Loctite®.

Nut or bolt back off is one reason why bolt preload can be lost, if the bolt is subject to cyclic loads it will break, the type of bolt will only have a bearing on how long it takes to fail.

The common types of nut locking devices are spring washer, nylock nut, lock wire, tabs and locktite®. Under severe vibration all these will fail to some degree. A new type of washer was shown to me by Steelmasters, these are called Nord-Lock® Washers. They have in fact been around for about twenty years but are not well known of. Each washer is in fact two identical

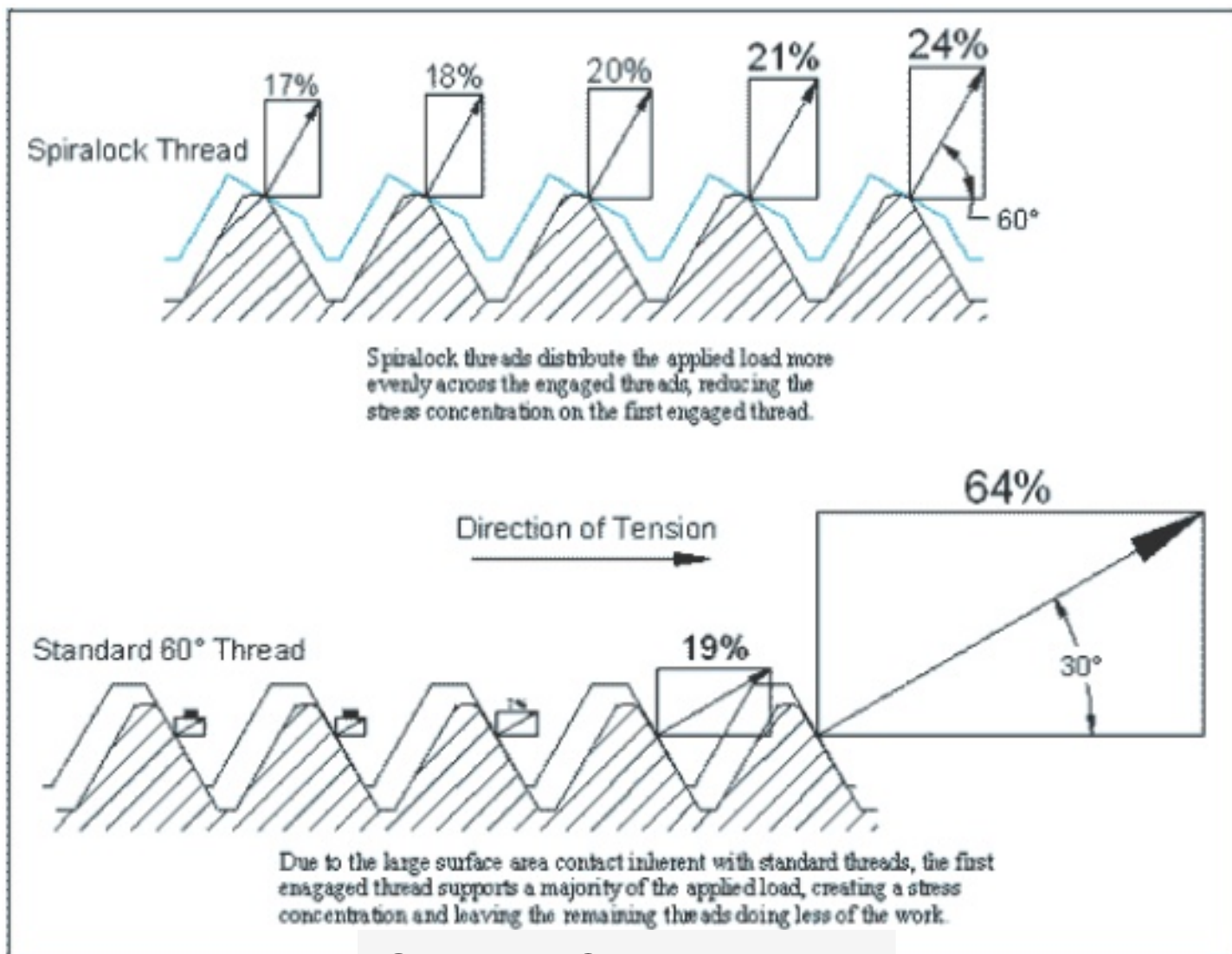


washers, one face has many small radial ridges which grip the material being bolted or the underside of the nut or bolt head, the hardness of the washers is more than a 12.9 bolt so no problems there. The other face has small wedges or cams which have an angle slightly greater than the helix angle of the thread of a nut or bolt. When the washers are placed face to face and the nut or bolt tightened, the ridges grip the work, when it comes time to undo, the ridges prevent the washer from turning, the only way out is for the wedged cams to slide up on each other. This sliding causes the bolt to lengthen and so increasing the

Nord Lock Washers

preload on the bolt, this can not happen without the use of a wrench. The simplicity of use and effectiveness can't be underestimated. For more information and a demo video check out www.nord-lock.com Nord-Lock® also have extensive torque tables and a torque calculation spreadsheet.

Spirallock® is another method of improving the friction of nut or bolt. It is a different type of female thread form which better distributes the axial force across more threads than a standard thread. As the forces are spread over a greater number of threads the chance of thread stripping is also reduced. The torque required to tighten a Spirallock® thread is 10% to 15% higher than normal but a test should be done if you are considering using these.



Spirallock® Thread Form

Spirallock® supply specialized taps to cut the threads and nuts with the specialized thread pre-cut. For more information go to www.spirallock.com

Loctite® 620 is the thread adhesive specified by Jabiru for the flywheel retaining bolts and several other bolts on their engines. As 620 is not primarily used as a thread lock adhesive I contacted Loctite® directly in order to get more information, the online data sheets do not give friction coefficients. I was told that 620 could be used as a thread locking product; it has the advantage of slower cure about one hour, and higher temperature resistance. I was given some K factors which relate to the friction coefficient of lightly machine oiled steel bolts, in other words Loctite® does not affect the torque of a standard bolt. This would also relate to a friction coefficient of 0.15 and I have used this figure in the torque calculations for the Jabiru bolts. The following is straight from the 620 data sheet.

"Loctite® 620 is designed for the bonding of cylindrical fitting parts. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. Typical applications include locating pins in radiator

assemblies, sleeves into pump housings and bearings in auto transmissions. Particularly suitable for applications where temperature resistance of up to 200°C is required."

For more information go to <http://www.loctite.co.nz>

It has also been suggested that 620 would, if lightly applied to the mating faces on the Jabiru flywheel, help prevent the fretting. Certainly the extract above would indicate this as a possible application, but I have yet to talk to anyone who has done this or found any other empirical evidence of it having been used in this way, I would be very interested to hear from anyone who has more information on this type of use.

From the President

Ian Sinclair



I.A. Workshops

I would like to thank Anton for running these workshops. The two I attended were well received and very informative. The feedback has been very positive. The resource CD that he has produced to support IA's and owners is top class and is designed to be a living / changing / growing document. As always your feedback and support will make it even better.

MOU with CAA

The RAANZ executive recently attended a Memorandum Of Understanding (MOU) meeting with CAA. These are always useful meetings. It is a forum where both sides can exchange information and discuss concerns. We asked CAA if there was any agenda within CAA to change the rules that microlighting operate under or to move the microlighting community further towards the Part 61 environment. Their response was that the current rules are catering for the needs of our sector and that there is no intention by CAA to introduce any changes to our rules. We explained the RAANZ believes the current rules and structures cater for our members and the wider microlight community and we sought to retain the status quo.



Aviation Safety Seminar

I attended the recent Safety Coordinators course in Wellington. It was a worthwhile and stimulating workshop. I would recommend this type of course to any RAANZ Instructor or IA. It mostly centres around enhancing communication and providing positive support to anyone who is faced with solving important issues that may impact on the safe operations of pilots and aircraft.

Weather

It's been really windy lately, at least everywhere I have been. This means there will soon be some really nice weather. If you have had a break over the winter, or due to our gusty season, screw your thinking cap back on before you head off to commit aviation. There are people who can assist you with any microlight problems you encounter so don't hesitate to ask.



Thanks

To everyone who has contributed to this issue. You know who you are and now so does our membership. If you have a camera, keyboard and a story, tell it to us in the RecPilot. It is your magazine. Own it and use it.

Editors Choice

The following contributors will receive a RAANZ Cap of the latest style
Willie Morton, Craig Gilbert and Brent Thompson

MOUNTAIN FLYING - BY WILLIE MORTON - Part 1 of 3

I greeted Kevin at Whangarei airport after he greased a 10/10 landing in his Zephyr. He had flown up from his home base at North Shore airfield keen for us to get away on our adventure mountain flying in the Southern Alps. I stowed my gear into the aircraft with his gear already on board. Sleeping bag, overnight bag stuffed with warm clothes, survival equipment, food, water and most importantly; an unopened velato cardboard merlot.

I considered the weight and balance figuring that if the aircraft was not able to do the job then it was not worth the accolades I'd heard. Ready to board Kevin asked, "which side do you want?" "I'll take the right hand seat". After refuelling we slowly taxied to the holding point runway 24 Whangarei where Kevin methodically ticked through the DVA checks. Meticulously I thought when he included "lifejackets on".

We lined up on 24 and he casually announced through the headset, "your aeroplane". Well, being in my usual starboard instructor seat I replied "I have control" and keyed the mike: "Whangarei Traffic Zulu Foxtrot Romeo is rolling 24 and vacating VFR to Christchurch". I then gently advanced the throttle to full noise and allowed the aircraft to take its own time in the takeoff roll with positive acceleration and tracked it along the runway centreline keeping it straight with rudder to the point where I felt the wings take up the weight and then rotation... gently raising the nose to permit the aircraft to follow its natural progression and then... and then weightlessness gently announced that we were airborne!

I concentrated during the rotation in my search for imbalance and for any unusual elevator input due to incorrect C of G. Nothing! We just climbed skyward like the ole' proverbial homesick angel. I gently banked the Zephyr left after takeoff and set heading for Muriwai beach which was on track to take us over the Kaipara harbour to anticipate Victor 175 for ten minutes of over the rugged west coast through Piha and Bethels and out over the traitorous Manukau harbour entrance to the south. I settled down our aeroplane straight and level and trimmed her in the cruise on track at 1,800 ft. I then began to scour over the instrument panel in search of undone housework. Flaps up, gear up, pitch cruise, 4,800 Revs, correct frequency, transponder on alt WHOOPS! A little flick of the wrist to the right for alt and no body noticed a thing! On we go!

I flipped over our transceiver to Dual Watch and simultaneously monitored Christchurch Information and the normal "G" airspace frequency 119.10.

Approaching Muriwai I changed to Whenuapai Tower and learned that there was an aircraft stooing around our intended track at low level. I called up the tower and made them aware of our intentions to minimise potential conflict and we continued south on mark one watch.

Crossing the Waikato river Kevin and I discussed our options and decided that we'd go direct to Wanganui. I changed course for the tiger country route and, as if carried by magic carpet, we immediately found ourselves over the Wanganui river at Pipiriki with Wanganui on the right, Ohakea on the left and fifteen minutes to run. Approaching Wanganui I asked out loud, "shall we make a landing here?" "What for ?" asked Kevin, well, that was a good enough question for me I thought.

We had chewed up just under half of our fuel since Whangarei and we were still good to go. The weather was beginning to build toward Cook Strait and there was also a bit of clag to the west. I was mulling through the options in my mind when the question arose, "which way

from here?” “Well, I think direct to Westport from here would give us better weather.” “Ok with me”, Kevin replied.

He took control of our aircraft while I fidgeted around reorganising myself in the cabin. We were making good time but I was aware that we had a headwind all the way. Kevin tracked us out to the west to avoid some airspace and impressed me big time by keeping a constant heading on the compass and accurate height control for a full one hour after which time he descended low level to get under cloud and, true to plan, the mainland came into view with the welcoming sight of Takaka and Golden Bay over our port wing. “This man can fly alright!” I muttered to myself in my mind.

I resumed control while he fished for his camera. During the over water leg I had tried several times to make radio contact with Christchurch in the hope of lodging a VFR flight plan for that stint but no show then kicked myself later for not thinking of Ohakea, a short distance behind us.



I decided to take the coastal route due to cloud build up in the valleys from Golden Bay and hugged the rugged west coast all the way around. I had had enough of flight over water for this stint and figured that for now, if you don't need to, you don't have to. I could at long last see Westport in the distance with its tell tale stacks bellowing unmentionables into the atmosphere. Nevertheless, a sight to behold.

In the final run for the line I began to compare the distance to go with the short distance the fuel gauge needle had to go to reach the end of the RED. Before I knew it we were calling downwind Westport then looking for a place to park this beautiful, slippery, runs on the smell of an oily rag, easy to fly machine. Kevin disembarked first to water a freestanding hanger which must've really enjoyed the warm trickle because it was emitting pleasurable ahhh's and ohhh's.

I sat in the plane and pondered over the first part of our adventure with incredulity of the non-stop flight in a microlight: all the way from Whangarei to Westport, in five hours, fully loaded, with much of it over inhospitable terrain, one and a quarter hours over water, wind on the nose with two average, run-of-the-mill pilots on two weeks leave, obsessed with adventure in the mountains and all ops normal.

I recounted all the “outs” we had planned, the nights we pored over maps, the different routes we planned to give us the best options and the best part about it all is that good planning works because it definitely worked for us.

(to be continued next month)

Situational Awareness

Evan Gardiner



I suspect that for many pilots, if a request was made to identify the many human factors that contribute to flight safety we would struggle to list more than a few of the really obvious ones. This is in spite of the fact that over 80% of aviation mishaps involve human factors - i.e. the person at the controls. To focus on just one aspect of human factors, FAA statistics show that spatial disorientation following loss of situational awareness cause up to 15 - 17% of fatal general aviation crashes annually. To focus in a little further, statistics reveal that 9 out of 10 spatial disorientation mishaps result in a fatality. Now that is a really scary fact.

Granted, these are statistics from GA accidents. Most spatial disorientation mishaps occur when pilots are flying at night and intentionally, (or inadvertently) flying in IMC weather (Instrument Meteorological Conditions). Not your usual microlight operating environment. However, there are many circumstances where even very experienced VFR pilots can be inadvertently exposed to a situational awareness event where if the correct action is not followed the consequences could be just as fatal.

A couple of real world examples here:

In strong wind conditions the pilot is aware of the aircraft's high groundspeed when turning from late downwind on to base leg prior to landing. His instinct based on this situational perception of his aircraft continuing to drift downwind is to counter the drift by tightening up the turn, overbanking and applying more back pressure than is prudent.

Many of our long distance flights in NZ involve tracking along a coastal route. As long as the cloudbase and visibility minimums are ok and there is a clear path to backtrack on to if conditions worsen there should be no problems. An important adjunct is to make sure that your flight track is far enough off the coast to allow a reciprocal turn to be safely made turning towards the land and not out to sea. Any turn made out to sea may present the pilot with a horizon difficult or impossible to distinguish in deteriorating conditions, key factors that can lead to the onset of spacial disorientation

A fully loaded aircraft trying to execute a climbing turn after take off, with no definitive true horizon and rising ground ahead risks a stall/spin accident. The tragic Tiger Moth accident at Taumarunui is a recent example of this scenario.

In fact, I suspect that in most stall/spin accidents the pilot has been confronted with some preceding situational awareness issue prior to the accident. I believe this, simply because there is no logical reason why a normally competent and safety conscious pilot would put himself, and/or his passenger, at risk by intentionally flying his aircraft at an unsafe slow airspeed or with the primary flight controls crossed up.

The frustrating part of this whole situational awareness/spatial disorientation thing is that apart from full instrument flight training there appears to be no training regime available, or clear path to follow, that will help prevent these types of accidents from happening in the future. Perhaps just talking about these issues is the most effective teaching tool.

I am sure many of us can recall at least one aviation safety situation - when we knew absolutely, and especially with hindsight, that this was the wrong path to follow. Let's all talk about this. If we can get some contributions from you, we will call this new column in the RecPilot:

I learned from this

To kick this column off, here is my contribution. A big H signified several days of settled weather and we decided to fly from my strip at Waitohi to Hokitika, where we would be based for a few days. We elected to fly through the Southern Alps via the Whitcombe Pass that runs between the Hokitika Gorge and the headwaters of the Rakaia River system. High up in the mountains we flew quite close to a glacier formed hanging valley that was so picture pretty that we stooed around the entrance to this alpine ampitheater for some time, just to savour the moment. This was summertime and the glacial lake had thawed to provide a sparkling mirror image of the overhanging ice and rock walls above it.

I was totally captivated and I really needed to fly around this valley to close out the experience. This valley was several hundred acres in size so there were no issues relating to insufficient manoeuvring area for the Ban-Bi. Even an engine out event was covered as the river valley was many thousands of feet below my flight path.

But as soon as I had ventured far enough down one side to lose peripheral vision of the

mouth of the amphitheater I knew I was in trouble. The mirror image reflecting off the lake blended with the real terrain, the sky and midday sun was a brilliant reflective orb in the middle of the lake and I had no idea where the true horizon was. It was as if I was flying in a fish bowl and I knew that the longer I held this track the more difficult it would be to recover my position safely. A simple descending turn (with lots of airspeed just in case!) and I was out of there.

On reflection, perhaps the most surprising thing about this experience was how the true horizon was so easily established once the "big picture" behind me was revealed.

What did I learn from all this? It is a fact, that without a stabilised gyro implanted in our head we really have no ability to function like a bird. That is why we build aeroplanes! Safe Flying

ARIZONA

by **Charles Russell**

The night was bitterly cold, stars like sparks in an unfamiliar sky tried vainly to take my mind off the shivering. 8800 feet above sea level on the North Rim of the Grand Canyon. We had seen helicopters and twins diving down across the gaping immensity in ordered corridors all day. It was pleasantly warm- nothing that prepared me for this. A bag of 'chippies' bought at lesser altitude had expanded to the point of exploding, threatening to cast its contents through the car we had rented. At last the sun came up and we could boil the billy and get down to more civilised depths. It requires an effort to climb minor hills and the heart pumps more quickly, even at rest. Sitting comfortably in an aeroplane, one does not notice these things past 10,000 feet, since there is no exertion. Only the eagles soaring effortlessly above us were at home here.

Driving out of the desolate area that was once forest (A massive fire a few months ago had destroyed millions of acres) we slowly warmed up as we descended. Our car displayed the outside air temperature, and curiously it rose as predicted 2 degrees every thousand feet we went down.

The sign said that the local airfield was next on the right. We slowed down not to miss it and sure enough a narrow rough road presented itself up front to turn down. It was hot. 40 odd degrees C, altitude above sea level 1400 feet. This was Arizona moving into the monsoon season. We stopped at the airfield carpark and wandered onto the concrete hardstand. To our left were basic single story office buildings, tatty, run down, wood and peeling paint. A Beech Bonanza sat forlornly in the car park alongside an ancient Caddie, its tail flapping jagged alloy in the breeze, wing tips broken and windscreen gone. Strangely, the engine was still intact and the variable pitch prop. In the still clean and tidy passenger seat lay the American version of our VFG, small and fat, information incomprehensible to us Kiwis. Across the concrete wavering in the heat was a hangar, door ajar. As we crossed the hardstand, an old man appeared from the hangar and challenged us. 'Can I help you?'

I replied that we were from New Zealand, both pilots, and that we were interested in looking at a typical desert airfield. He asked us if we were terrorists. I told him that we did not wear towels on our heads, he smiled, relaxing somewhat. We entered the hangar and looked at the Piper Warrior he was working on. A motorised parachute sat in one corner; the owner had taken off on his second excursion into the blue, caught a massive thermal and nearly killed himself trying to get back to terra firma. It was for sale. A Thruster sat beside it, used once for instruction, since 9/11, it was no longer viable. The instruction this minor field once enjoyed has been destroyed by insurance demands. The Bonanza had been smashed by a mini tornado entering the hangar, lifting it from its foundations, flipping the plane and dumping the structure on the poor guy working on his plane. He had no insurance, so his widow is now struggling to make ends meet.

Instruction has ended due to American paranoia, insurance being prohibitive. They have a terrible demand imposed on them that has killed all initiative. Our man was waiting for a Cessna Citation coming in for fuel. A very old Cessna 150 was tied down in front of the hangar. Polished alluminium oxidised in the heat sitting at a jaunty angle only tail-draggers can affect. A couple of planes sat patiently in their open hangars near the runway. We asked him what the density altitude was at this strip. At this time of year approaching the monsoon, the heat and low pressure can produce an altitude of 5000 feet. You can fly out with calm conditions and arrive back with 40-knot gusts making a landing somewhat demanding. We were told that planes occasionally flip on landing due to these sudden wind

changes. The runway is concrete, 5000 feet long, constructed by the local council. Any aircraft with marginal performance needs all the length it can get to become airborne.

The Aero Club and private owners pay leases on the hangars and 10 cents a gallon tax on fuel. Things have died since Bush's banal 'war on terror'.

One can only speculate on how these small strips will survive in the future. Demands on land in the more populated areas of the States are seeing them squeezed out by expanding urban development or a more 'useful' deployment of the land.

We have little experience of extreme density altitude changes in Godzone. In one day we drove from 8800 feet to near sea level. Doing that in an aircraft would take a few hours. Calculating engine performances in these conditions can be interesting. Ensuring trivialities like area QNH takes on a whole new meaning. Imagine being over a thousand feet out over a couple of hours! Around Arizona most aircraft are turbines. Single engine piston types fly quite high seeking calm conditions away from the thermals lower down. The engines scream away at full throttle but only develop 60% power leaned out so do not I suppose, work too hard. One can only speculate on flying a 2-stroke for long periods under these conditions! Cooling is the biggest factor and it is vital to make sure the baffles are up to it.

The landmass being so vast, weather conditions are reasonably predictable. One can observe huge electrical storms and spectacular cloud formations around the mountains, but where one sits enjoying the view, nothing happens.

We got to Tucson that evening with a view to visiting the Pima Air Museum and the Desert Bone Yard the next day. Height above sea level was around 550 feet. Our distended bag of chips had not failed us and was back to normal.

**Notice and Agenda for the Annual General Meeting
of the
Recreational Aircraft Association of New Zealand Inc.
to be held at the
Waikato Aero Club clubrooms, Steele Rd, Hamilton Airport
on
November 18th, 2006 at 10:00 am**

- 1. Register of Voting Strength and Proxies**
- 2. Apologies**
- 3. Minutes of the Previous AGM**
- 4. Matters Arising from Previous Minutes**
- 5. President's Report**
- 6. Treasurer's Report**
- 7. Operations Officer's Report**
- 8. Technical Officer's Report**
- 9. Election of Executive Officers**
- 10. Remits**
- 11. General Business**



REMIT: RAANZ Membership Options



Background to the proposal

There are now three 149 organisations in NZ. RAANZ accepts the reality that each one of these organisations will aspire to be NZ's premier microlight organisation. RAANZ intends to maintain its leading position and recognises that this will need some fine tuning of our structure at this time.

The potential exists for clubs previously affiliated to RAANZ to become disaffiliated in the new environment. This will disenfranchise any of their pilots who wish to remain with RAANZ.

Your executive has examined the options available to allow RAANZ to operate effectively in this new competitive environment and we have formulated a new initiative that will require a change to our constitution.

The significant aspects resulting from this change are presented below for your consideration. We suggest that you actively participate in the process of discussing this proposal at club level before voting for or against the remit that we will present at this year's AGM on the 18th November.

The remit

Currently our constitution has the following requirement:

7.1 - The Society shall consist of an unlimited number of full members. All members must be current members of a club which is an Affiliated Club of the Society.

Our proposed change would read:

7.1 - The Society shall consist of an unlimited number of full members.

Explanatory note

It is accepted that a strong club based organisation is very much a part of RAANZ, now and in the future. However, with the changing environment, it is obvious that the rule that all RAANZ issued microlight certificate holders must also be a member of an affiliated club may result in a number of our members being disenfranchised. This constitutional change allows those members who are no longer a member of a RAANZ affiliated microlight club the option of retaining their membership of RAANZ and the right to hold a RAANZ issued flight certificate.

Points to consider

* There are now three 149 organisations in NZ. RAANZ needs to fine tune its structure to maintain its position as NZ's premier microlight organisation.

* This proposal allows disenfranchised members to retain membership of RAANZ.

* Microlight club based activities - social and flight training - are now such an established feature of the NZ microlight scene that we doubt this change will significantly affect club membership levels. It is noted that many SAC clients are also members of our clubs, not because it is a requirement, but because they choose to. Microlight clubs will have complete discretion as to their membership requirements for those pilots that use their club facilities. ie they can require all pilots that fly their club plane or utilise their IAs or instructors to be a paid up club member - if they choose to. This will now be a decision for each individual club rather than a RAANZ procedural requirement.

*Our procedures manual will require that all our IAs, ATOs, and instructors must be a member of, or tied to a RAANZ affiliated club. This requirement retains most of the core advantages of the previous rule and eliminates the risk of 'soft option' instructors operating outside club boundaries.

*The 'out of area' requirement remains as before. This rule requires any instructor that has been approached to process a certificate renewal or upgrade from an 'out of area' pilot to first make contact with the pilot's previous instructor. If this instructor has any reservations about the pilots renewal or upgrade the flight test must not proceed.



AGM - 2006 Executive Nomination

We nominate _____

as a candidate for election to the RAANZ executive.

Nominating club _____

Nominating club officers signature _____

I accept the nomination and am prepared to stand as a candidate for election to the RAANZ executive

Nominee signature _____



AGM - 2006 Remit

We submit the following remit for consideration at the RAANZ AGM

Submitting club _____

Submitting club officers signature _____



AGM - 2006 Proxy

We authorise _____

as our club proxy at the AGM

Authorising club _____

Authorising club officers signature _____

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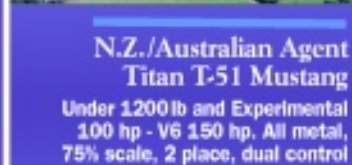
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