BRISBANE VALLEY FLYER

November 2023

BRISBANE VALLEY SPORT AVIATION CLUB INC

Watts Bridge Memorial Airfield, Cressbrook-Caboonbah Road, Toogoolawah, Q'ld 4313.
Rob Knight (Editor) Tel: 0400 89 3632, Email kni.rob@bigpond.com

The Bell YF-1 – Airacuda. Fantastic, Flop, or Failure. See page 20.

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Our website - **bvsav.com.au**

Greetings members,

It has been a very busy month.

At our last meeting we welcome 3 new members.

The club was able to help Peter Freeman plant the new Vetta grass and I would like to thank all that came and helped, we had 9 members from the club helping out on the day. We still have 1 more plot to plant but that will be later in the month or next month, we will let you a know when this is to occur.

I would also like to thank Mary Clark for helping John Yates and his team clean and paint runway markers.

Please See our AGM notice overleaf. It would be good to see you there.

Best wishes

Peter Ratcliffe
President BVSAC

NOTICE

PLEASE BE ADVISED

The Brisbane Valley Sport Aviation Club Committee do hereby notify our members of our intention to hold the BVSAC 2023 AGM on Saturday 4th November 2023 at 10am.

Nominations are sought for the following positions which will become vacant at the AGM - President, Vice President, Secretary, Treasurer, Technical Officer, Social Officer and Membership Officer.

Nomination forms and Proxy forms will be sent out to all members via email in the coming week.

Peter Ratcliffe (Secretary (Acting))
Telephone 0418 159 429

My SLA Battery is Going – Going – Going - ??????

By Rob Knight

Sealed Lead Acid (SLA) batteries are the power source of hundreds of applications, from emergency lighting and wheelchairs to floor scrubbers and data centres. Let's check on how to get the most life possible out of your SLA batteries and how to recognise when one has reached the end of its working life.

What is an SLA Battery?

The primary difference between SLAs and other lead acid batteries is that, as their name dictates, they are sealed. This makes them ideal for aircraft as they are completely leak-proof and it allows them to be mounted in a variety of positions without fear of spillage. Another advantage is that no "top offs" are required - the electrolyte inside them is sealed into them. This is possible because the gasses produced by the functioning SLA battery are reabsorbed into the battery's electrolyte and so eliminate the need for additional distilled water.

Some SLA batteries are also designated as being an AGM type. This reflects the batteries use of absorbent glass matt fibres between the positive and negative plates that help absorb all the battery acid. AGM Batteries are advanced lead-acid batteries.

How Long Does an SLA Battery Last?

The life of an SLA battery is dependent upon a number of factors. These include what it's being used for, the operating temperature and how well it's been maintained. Battery life is measured in charging cycles. A single charging cycle refers to the process of going from the battery's full charge capacity to a complete discharge. As a ballpark figure, you can expect an SLA battery to last between 50 and 500 charging cycles.

Maintaining an SLA Battery

Obviously, we all want to get the longest life possible out of our batteries. Accomplishing that depends largely on the charging habits to which that battery is exposed. For starters, we need to ensure that we're using an appropriate battery charger. When fitted into an aeroplane electrical system and functioning with an alternator to maintain a fully charged state, they run virtually trouble free. However, should one become discharged due to the MASTER switch left on, or for any other finger-trouble reason, they will require recharging outside the aircraft's system. Herein lies a serious challenge to the longevity of the battery if a charger that is not compatible to that battery is used to replenish the charged state. Always check the details relating to a charger to ensure that it is compatible and won't cause damage to the battery. Note that gel batteries used in solar power, wind generation and communications applications require a different charge voltage than other sealed lead acid batteries. Also, when selecting a charger, be sure that it's rated for your battery's specific voltage.

Batteries are particularly susceptible to damage during the charging process. When charging externally, be sure to avoid overcharging. Do not speed up the charging time or increase the voltage in an attempt to charge a battery faster. Overcharging leads to overheating, which can kill your battery completely in just a few hours.

Undercharging is equally problematic. Do not use a lower charging voltage than your battery requires as this will prevent your battery from becoming fully charged. When a battery is

undercharged it has to work much harder than a fully charged one, resulting in a shortened battery life.

In light of the above, aircraft systems will maintain the charge on a fitted battery without issue, provided that battery is correct for the use to which it is exposed. For the best battery life, an appropriate battery should be fitted at all times.

SLA Battery Charging & Storage Tips (external to aircraft installation)

Follow these suggestions to recharge your battery

- Recharge your battery after each use
- Always store your battery fully charged
- Disconnect the charger immediately once the battery is fully charged
- When storing an SLA battery, be sure to keep it in a cool, dry place
- Do not store an SLA battery in a discharged state
- When storing a battery, check its charge every couple of months
- If the battery is stored in an area with a temperature above 68 degrees F, it will need to be charged more frequently

Maintaining your SLA battery Charge over Time

All batteries discharge over time. Yes, even when they are not connected to a circuit there is a natural discharge rate that will slowly reduce the charge contained. The causes are several, chemical reactions in both the electrolyte and electrodes, natural leakage between cells, and temperature.

Battery Type	Estimated Discharge Rate
Alkaline	2 to 3%/year. 10-year shelf life.
Lead/acid	10 to 15% in first 24 hours, then 10 to 15%/month.
Ni-Cd	10%/month.
Li-ion	5% in first 24 hours, then 1 to 2%/month.
NiMH	Up to 70%/month.

Table 1

From Table 1 above, it can be seen that batteries left unused for periods of time will slowly discharge. Most batteries fitted into aircraft are lead/acid and these lose charge at a rate that could remove the ability to start the engine after a few months. For most systems, even after a month unused, the cranking speed on start can be noticeably slower, and after three months very much slower, maybe insufficient to get the motor running. This time period can be even lower for older batteries.

Some owners of light and ultra-light aeroplanes install battery charge maintainer units to avoid this issue. These units may be 240V systems and simply plug into the hangar 240V 3-pin plug. However,

for hangars not so equipped, solar units are available, and they are relatively inexpensive. Battery charge maintainers send small amounts of energy to a battery to ensure that it remains at its full capacity when it sits for any extended period. In addition, the use of a maintainer has a beneficial effect on battery life, as well, by ensuring there are no deep discharge periods followed by intense electrical activity recharging the battery back to full capacity.

Battery maintainers of both 240V and solar powered types are available from many outlets – Supercheap Auto, Autobarn, and eBay, to name a few.

WARNING – Battery Maintainer units must contain a dedicated regulator to avoid potential overcharging. Without a regulating device, a battery can be killed stone-dead in a single day.

In addition to battery charge maintainers, some homebuilt aircraft owners and maintainers have found success in minimising battery self-discharge issues by fitting a battery isolating switch into the battery earth lead. These come either keyed, or as a simple toggle switch, but in either case merely eliminate any trickle discharge from the battery whilst the aircraft is standing unused. These can be purchased at minimal cost from Repco or Supercheap Auto.

Battery isolator switch

Signs That Your SLA Battery is Dying

Even with the proper care and storage, your SLA battery will eventually need to be replaced. If your battery is failing to hold a charge, you can always merely replace it (with an appropriate exchange model and type) or you can arrange to have it tested.

However, if your battery is looking swollen or cracked, or you find a buildup of corrosion on its terminals, that's a good sign that it's been overcharged. Apart from checking the battery, it would also be very wise to check the aircraft charging system, If the charging system is not functioning correctly, simply replacing the old battery with a new one may lead to having two failed batteries.

Check for corrosion of the positive and negative terminals Where found corrosion can be cleaned off using a wire terminal brush and a solution made out of water and baking soda. However, if the battery is swollen, it’s too late and the damaged has already been done. Replacing the battery is the only resolution and it will need to be done ASAP.

Have Your SLA Battery Tested

Are you looking for an easy way to tell if your SLA battery needs replacing? Remove it from your aircraft and take it to your nearest Battery World, or Batteries Plus, outlet and have it tested. These experts can tell if your battery still has life remaining, or if it's time to invest in a replacement. Caution – these companies are commercial enterprises and will encourage you to purchase a replacement. But, of course, following this option does give you that – options.

In conclusion it only remains for me to remind readers to always follow the instructions that come with any battery. This advice is relevant to the fitting of the battery, the charging in-aircraft of the battery, and any external recharging away from the aircraft. Failing to follow the manufacturer’s advice seldom enhances the longevity of any device, and batteries are no different.

If you replace an old, failed unit with a new battery, even if it's just a new manufacturer for the same type of device, remember to save the information details that are sold with that battery for future reference.

Happy Flying ------ ooOOoo ------

Air Safety Institute's Richard McSpadden Dies In Crash

By Russ Niles. AVweb. Published: October 1, 2023

Richard McSpadden, the senior vice president of the AOPA Air Safety Institute died, along with one other person, in the crash of a Cessna 177RG near Lake Placid Airport in upstate New York Sunday, October 1, 2023.

McSpadden was in the right seat. The other person has not been identified. AOPA spokesman Eric Blinderman told AVweb early reports indicate the Cardinal had "an emergency on take-off" from Lake Placid shortly before 5 p.m. "They tried to get back but didn't make the runway," said Blinderman. The nature of the emergency wasn't immediately known. He said more information will be available on Monday.

McSpadden was a former commander of the USAF Thunderbirds air demonstration team and joined the Air Safety Institute in 2017. He was well known in the GA community for his analyses of accidents and the safety related content he and his staff created for free distribution. He was also highly regarded by his many friends and colleagues. "We are beyond heartbroken," said Blinderman. "This is the worst kind of news to process as a friend, colleague and fellow aviator." He is survived by his wife Judy, son Grant and daughter Annabel.

This is a huge loss for all of aviation but especially general aviation. He made a tremendous contribution to aviation safety and will be greatly missed.

Aviation is an unforgiving occupation and, whilst we all strive to the upmost in all safety issues, the loss of a man of Richard's standing is a shock to all.

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Homebuilt Accidents: Passing the Engine Baton (USA)

By Ron Wanttaja, Kitplanes, December 19, 2022

How does the Rotax 912 compare to traditional engines used in small home-builts?

When looking at homebuilding magazines from the ’60s and ’70s, one factor that stands out is the engine selection: Most were using the small Continental engines, from the A65 to the O-200.

The main reason was availability. These engines were used by the thousands in the American lightplane industry after WW-II. As planes like Piper Cubs, Aeronca Champs and Luscombes were scrapped, their engines ended up available in the used market. Enter the “rag overhaul”: Buy an engine from the junkyard, wipe up the dirt and see if it will run.

During post-accident analysis, NTSB investigators found several items that could have led to this Rotax 912 stoppage, including the lack of a fuel return line, a loose exhaust pipe, dirty air filters and a disconnected choke lever. However, an engine run was conducted with no apparent problems with power. (Photo: NTSB)

The price was certainly right. In the plans for the Bowers Fly Baby, Pete Bowers wrote, “While the A65 is out of production, it is still plentiful on the second-hand market. Some with high time on them (500 hours or more since overhaul) can be had for $150–$300.”

There are still a lot of the small Continental engines on the U.S. registry. Ten percent of the aircraft on the rolls mount the A65, A/C75, A80, C85, C90 or O-200 engine.

Still, only the latter is still being built. Everything else left the factory floors at least 50 years ago.

On paper, at least, the Rotax 912 looks like the perfect replacement. It’s light, it’s four-stroke and it even looks a lot like a traditional aircraft engine.

Before we pass the small-engine baton to the Rotax, there’s a fundamental question: Is it as reliable as the old traditional Continentals?

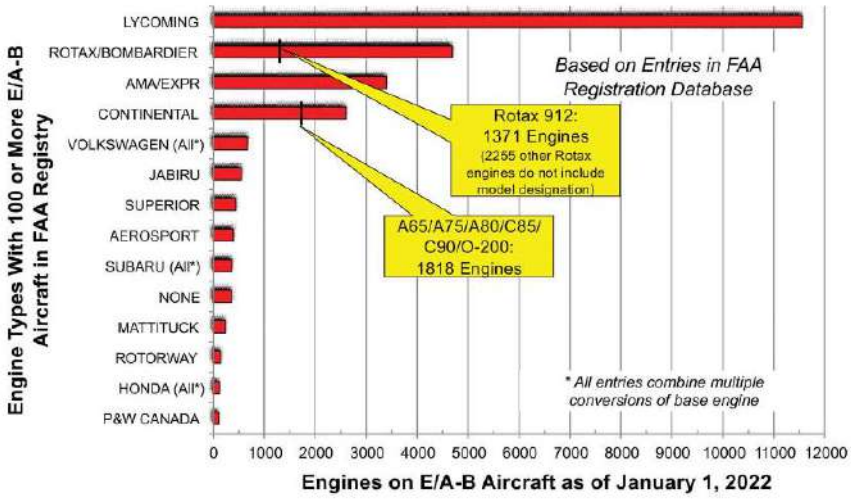

Figure 1. Looking at overall FAA registrations, Rotaxes are the second-most-common engines on homebuilt aircraft. At least a third of those, probably more, are Rotax 912s.

Fleet Size

How many of a given type of engine are installed on homebuilt aircraft?

It's difficult to say. The FAA registry has spotty detail. The registry usually includes the specific engine type for aircraft mounting certified engines, but anything else is pretty random.

Figure 1 shows the number of engines installed in E/A-B aircraft. Of no surprise is that Lycoming leads the list. That's about 40% of all homebuilt aircraft—not really surprising with Lycomings gracing the noses of thousands of RVs.

The surprise is No. 2: Rotax. Between "Rotax" and "Bombardier" listings, Rotax engines power about 17% of the homebuilt fleet.

Our problem is that out of the 4700 Rotax-powered E/A-Bs in the registry, almost half (2250) don't specify an engine model. Some of those are undoubtedly Rotax 912s, but there are a lot of Rotax engine models. There's no way to tell. About 1300 E/A-B registrations do specify models of the Rotax 912—but certainly additional examples lurk in the model-not-listed category.

Of the cases where a Rotax-powered aircraft does have its engine model included, over half are Rotax 912s. So there are likely to be another thousand 912s in the homebuilt fleet.

Number three on the list throws our statistics for a tizzy: One of every eight home-builts has the engine listed as "AMA/EXPR." For whatever reason, the builder decided not to list the engine make or model. These could be just about any engine type, including Rotax 912s, Continental O-200s, or any number of auto conversions.

Continental comes in at No. 4, with almost 2600 installations on E/A-B aircraft. About 1800 of them are the "small" Continentals, A65s through O-200s.

Figure 2 shows the total number of E/A-B aircraft accidents from 1998–2022 with specific engines. Accidents involving mechanical failure are in red. The Rotax 912 has the lowest rate of mechanical failure.

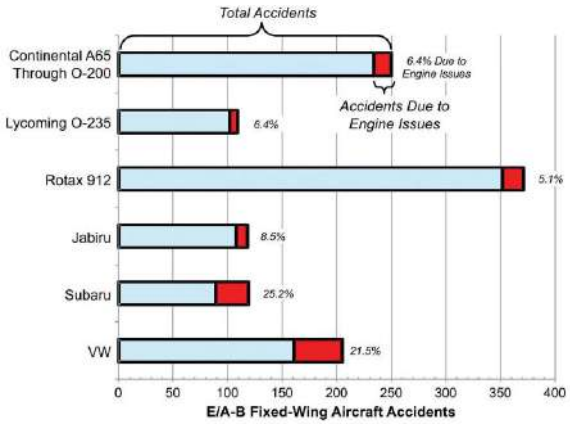

Figure 2. Accidents in volving engine mechanical issues

Picking The Accidents

Normally, when I compare homebuilt aircraft types, the basic factor is the number of accidents that were triggered by a loss of engine power for any reason. These account for nearly a third of all homebuilt accidents.

Builders of Zenith airplanes can often select between a variety of engine types, including both the small Continentals as well as the Rotax 912.

However, when comparing engines, this is rather unfair. It includes cases where problems occurred with the aircraft fuel system or even the instances where the pilots ran out of gas.

Instead, let's look at the instances where the loss of power was due to a mechanical failure of the engine. This includes both cases where the engine spontaneously quit, as well as the incidents where the builder's or maintainer's errors led to the failure.

Figure 2 above right shows the results. The full length of the bars shows the total number of accidents that occurred to E/A-B aircraft with that type of engine. The red

"tip" shows the number of accidents that were due to mechanical failure of the engine. The percentage at the end of the bars shows the ratio of accidents due to the engines.

While the data for this analysis is based solely on Experimental/Amateur-Built aircraft accidents, the results should be applicable to Rotax 912s installed on Light Sport Aircraft.

The Rotax 912 has the lowest rate of all engines examined.

While the data for this analysis is based solely on Experimental/ Amateur-Built aircraft accidents, the results should be applicable to Rotax 912s installed on Light Sport Aircraft.

Breakdown Breakdown

Now, wait a minute. The 912 is (partially) liquid cooled and requires a radiator. It has a reduction drive and electronic ignition. All three are often problems on auto engine conversions. How do they stack up on the Rotax 912?

Figure 3 (below right) compares the number of engine issues in a variety of categories. Note that this is not the percentage—it is the actual number of cases in my database that involved each system. It totals 16 for the Continentals and 19 for the Rotax 912s. With these small sample sizes, percentages can vary too much. Let's look at raw numbers, instead.

Cooling, ignition and gearbox issues? No E/A-B Rotax 912 accidents at all attributed to the reduction drive, only one to the cooling system, and the Rotax electronic ignition saw half the number of problems of the conventional magnetos used on (most of) the small Continentals.

As Figure 3 indicates, Rotax 912 failures (in yellow) are extremely rare in many categories. The oil system and carburettor/induction categories have a variety of failures, many of which involve builder or maintainer error.

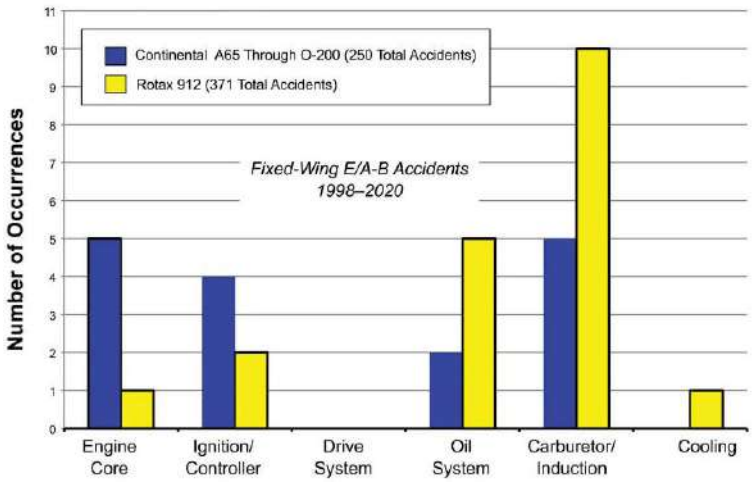

Figure 3. Types of engine mechanical issues.

Only one of the 371 accidents involving fixed-wing E/A-B aircraft with Rotax 912s involved a failure in the core engine. That was a failed valve pushrod seal that had been removed and reused by the aircraft owner. The 912 saw no failures of the major components such as connecting rods or valves over the 23-year period examined.

Figure 3 shows us that if we have to pick at the Rotax 912, there are two categories to examine: issues with the oil system and problems with the carburettor or induction system.

Remember, though, that there are 50% more Rotax 912 accidents than our small Continental set. And the sample size, as I mentioned, is low. There were two small Continental-powered homebuilt accidents attributed to the oil system, for instance, versus just five for the Rotax set. The difference isn't that significant.

And I'm not seeing any recurring failures. For the five oil system cases, two were failures of oil lines (one was builder error), one was trash in the oil tank (probably also builder error), a Kitfox owner installed the wrong oil filter and the final one is a "dual entry" for the reused pushrod seal (its failure led to a loss of oil).

For the carburettor/induction cases, other than three involving improperly secured carburettors or controls, there weren't any common causes. In addition to those three, another couple of cases were directly related to maintenance issues.

Figure 4 (right). While about a third of all homebuilt accidents are due to a loss of engine power, mechanical failure of the engines is only a portion of the issue.

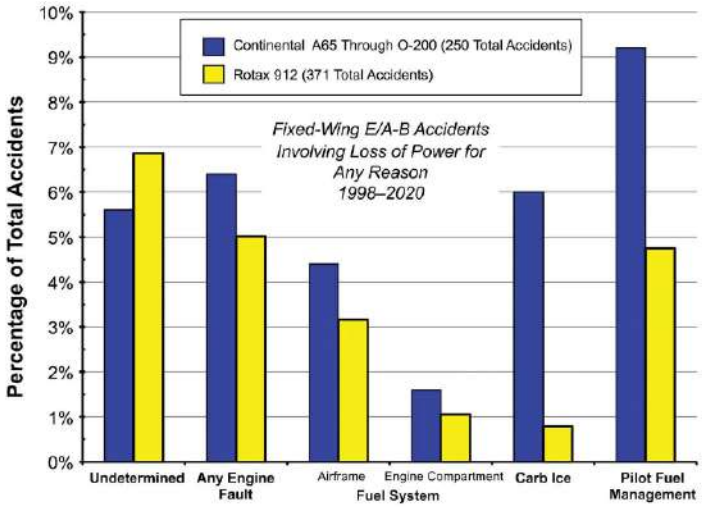

Figure 4. Over-all engine failure causes.

Other Power Failure Causes

In 26 of 371 fixed-wing E/A-B accidents on aircraft carrying a Rotax 912, the aircraft lost engine power but the NTSB was unable to determine why. That's about 7% of all the 912-powered accidents. It's a little higher than the small Continentals—14 out of 250, or 5.6%, versus 26 out of 371 for the Rotaxs.

Why? Likely it's probably just due to the NTSB investigator's familiarity with the small Continentals. They may be more experienced at figuring out failures of those well-known engines.

The small Continentals have about five times the rate of carburettor-ice-related accidents. Some 912s are fuel-injected, but in the other models, the carburettors are snugged up to the warm crankcase. Continental's updraft system isolates the carburettor from engine heat, making them more reliant on separate heating of the incoming air.

Curiously, aircraft powered by the small Continentals suffer power failures due to pilot mismanagement of the fuel twice as often as those carrying Rotax 912s. I've no good explanation for this. It's possible, as a more-modern engine, aircraft carrying Rotax 912s might be more likely to include automated fuel monitoring systems. These could be giving pilots more insight into the actual fuel state of the aircraft.

The Bottom Line

For years, folks have complained that traditional aircraft engines need to be replaced by powerplants using modern technology.

As far as the small Continentals are concerned—well, the replacement is here. Data shows the Rotax 912 has better reliability than the traditional workhorses.

However, our "Continental" category suffered by lumping a number of different models together. Looking just at the O-200, the Rotax 912 and the O-200 have nearly identical statistics.

The owner of this Aventura had been in the process of modifying the carburetion. NTSB investigators found the top spark plug to be black and sooty, consistent with the Rotax 912 engine running

The downside? Cost. I'd love to replace the C85 on my Fly Baby with a 912, but the four-stroke Rotaxs start at about twice what my airplane is worth. For that matter, so do the brand-new O-200s.

When you think about it, though, that's the way it was in the early homebuilding days, too. Few, if anyone, bought a brand-new C85 to bolt onto the front of a Stits Playboy. Those wanting engine reliability at a budget opted for good used engines.

It's not an impossible option for those interested in Rotax 912s. Used engines are available. It may be a hard way to look at it, but the more Special and Experimental Light Sport Aircraft that are added to the registry, the more used Rotax 912s will eventually wind up for sale.

The nice thing is, the engines have been around for quite a while. There are a lot of online resources for troubleshooting, including dedicated factory support.

Continental vs. Rotax 912? If we include only the O-200, the two competitors are neck and neck. Maybe the baton hasn't been passed, but both engines are marvellous options.

(Note: Photos and illustrations: Ron Wanttaja)

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Notice of Change to Airspace –
The Introduction of MOA, (Military Operating Areas)

The first MOAs are expected to be introduced on 30 November 2023 at the following military bases and will be distinguished with a 'M' prefix:

- Cerberus (Vic)
- Edinburgh (SA)
- East Sale (Vic)
- Nowra (NSW)
- Williamtown (NSW).

All military restricted areas outside Australian territory, and some areas within Australian territory, are expected to transition to MOAs by 28 November 2024. These changes will bring us into line with international law and International Civil Aviation Organization requirements.

The following conditions will apply when seeking access to MOAs:

- **Australian registered aircraft** must request a clearance to transit a MOA and conditions of entry may be imposed.
- **Foreign registered aircraft** can transit a MOA outside Australian territory without a clearance. Within Australian territory a clearance must be requested, and conditions of entry may be imposed. It's strongly recommended they comply with the requirements of MOAs as if they are an Australian registered aircraft.

Aircraft operators should update their documentation to reflect the introduction of MOAs.

All operators and pilots are required to review the Aeronautical Information Package (AIP) before planning a flight.

More information is available on our Extraterritorial airspace webpage.

This advice was extracted from:
Learn about new military operating areas | Civil Aviation Safety Authority (casa.gov.au)

Author Note:

As this dictates that a clearance is required to operate within an MOA, all MOAs are controlled airspace.

A pilot qualified solely on an RAAus Pilot Certificate and who does not also hold a Controlled Airspace endorsement is therefore precluded from operating within an MOA.

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The Meat in the Sandwich

By Rob Knight

On day in the in the mid-1980s I was working through a towering cloud of resented paperwork required by NZCAA. On this day, my door was ajar, and it opened into the main lounge and coffee area for Wellington Aero Club members. Amongst the drone of conversations, one registered more clearly and raised my hackles. A newly qualified PPL was passing advice based on his vast experience to another who was only nearing PPL flight test. The talker's cheek, arrogance, and gall were astounding and I was spellbound.

He was referring to a recent cross-country flight he had made to Taupo, in the centre of the North Island, and how, although his flight authorisation was written to exclude his flying over 8/8ths cloud or fog, he had ignored his limitations and suffered no repercussions. The Club, he claimed, imposed such limitations only to force members to fly around such obstacles to increase flight times and revenue.

Trained by my immediate predecessor, this pilot and I had already had a serious discipline meeting in regard to his being caught taking passengers into the low flying area to let them experience his skills at low level. Under NZ law, this was forbidden to everyone; no passengers could be carried whilst operating in a designated low flying area, or anywhere else below 500 feet AGL except taking-off or landing. Yet he had three passengers and only about 55 hours logged (with only 5 in a Grumman AA5 traveller, ZK-DLB) at that time. That discussion was brief, one-sided, and blunt. But now he was flexing his new-found wings in another direction – and while they were still wet.

In his own words, he had taken off from Taupo around 0900 hours. The fog was thick but he said to his listener that he could see about halfway down the runway and he needed less than that for take-off so he opened the throttle and departed. He and his two passengers were going home to Wellington.

Able to maintain a visual horizon, he said that, for the entire leg back as far as Foxton, he had 8/8th cloud above, and he was over 8/8ths continuous fog.

Without knowing the term, he was the meat in the sandwich, but, with his minimal experience, was quite unaware of the potential hazards; only of his supposed savings on the cost of the flight.

I checked the records and found the authorising instructor for his flight to Taupo. When she returned, I checked what authorisation she had given him. Perfectly in accord with Club rules, and in writing, the pilot signed that he understood and agreed not to fly at any time over more than 4/8ths cloud or fog.

I called a meeting of the pilot and his instructor and faced the stroppy 19-year-old trying to stare me down when I declined to acknowledge his right to fly according to his own minima. His hire agreement put him on contract to the Club and, under contract law, he could only operate within his instructor-given and his signed-for authorisation. As his hubris blocked his ears to advice, I had no option but to remove his flying privileges and ground him, but additionally offered to allow him to fly in his desired manner if we flew together and he proved to me as the CFI that he could handle the potential issues. He thought that he had me there, so he grabbed the offer and we made a booking for the following weekend.

At that time, he had already met the mandatory requirement for 5 hours of logged dual instrument time for his unrestricted PPL, but that had been done in a Beechcraft B77 Skipper equipped with an artificial horizon and a directional gyro to make it easy. For this exercise, I planned a trip to Masterton in the same aircraft he took to Taupo which, at that time, had only a turn co-ordinator on its panel to gather appreciation of yaw or turn. Our exercise was to fly around the coast to the east

of Wellinton and up the Wairarapa Valley, an area clear of controlled airspace over low-lying ground, with mountains to the west and high ranges to the east.

We did not file a flight plan. I was out to do some teaching and not make ATC's job any harder.

We took off and turned left to head around the cliffs to the west of Wellington Airport, and soon crossing the coast at Palliser Bay to head north to Masterton. Clear of the coast and level at 3000 feet QNH I told him that we were assuming we were just 2000 feet AGL (as he had been on his earlier flight) and I pulled the power. After a puzzled look and a quick comment from me, he began to carry out a practice forced landing.

In the middle of his engine trouble checks, when he was busy and pre-occupied, I passed him an instrument hood I had brought with us and told him to put it on, telling him that we had just descended into simulated 8/8ths fog. He lost control in less than 200 feet and I pulled his IF hood off when the aircraft had rolled past the vertical and the VSI had pegged out. He was horrified and complained that I had trapped him and the lesson was unrealistic.

As we climbed back to altitude, I asked him why he thought that the exercise I had set up was unrealistic. He said that engine failures didn't happen just like that, but when I asked why that was, he couldn't answer. He then added that I had cheated and surprised him when I said there was fog underneath, and that was why he had lost it.

Example of a pilot wearing an instrument flying hood.

So, I asked him to nominate the fog height so he could be prepared and we could try again. He did, and I closed the throttle. Again, and in less than 2 minutes, I took control back because we were, again, in his favourite spiral dive.

His colourful depiction of my supposed ill treatment continued as we climbed back up. But now there was a veneer of growing anger, and the marital state of my parents at my birth became a topic. Back at 3000 feet, I let him fly for a bit, in silence, to cool-off. Then we tried a third time. The results were predictably the same, which I could have told him had he been listening. With his experience and attitude, added to his now very agitated state, there was no way he was going to transition to gliding into IMC and maintain control.

We aborted the rest of the trip to Masterton – I had made my point, even if he didn't agree with it. I had proved that he clearly wasn't up-to-speed, and the Club-required minimums would remain in force.

While he did mellow some over the next year or so, and he accepted the minimums that were set, his intransigence continued to lead him into further conflict with both me, as the CFI, and with NZCAA, particularly in regard to refusals to comply with ATC instructions on several instances. He complained (in writing) to the Aero Club Committee when I refused to start CPL training for him, and I was instructed to do it against my advice. Consequently, he did pass a CPL flight test but I had arranged for another instructor to share the training to have a back-up opinion should he "become even more difficult". True to his colours, when he did pass the test, filled with self-congratulations he said how lucky I had been to have such a gifted candidate to teach. I disagreed and advised him that I had got him a CPL in spite of his best efforts, at which point I learned several new expletives and he stormed out.

He went elsewhere and did a multi-engined rating and followed it with a multi-engined instrument ticket. Then one day he called me and requested a job as a Club line instructor. I advised him we had no staff vacancies at that time, and none for him for the foreseeable future. Angry, still, he slammed the phone down. Three weeks later one of our office girls took a message from him for me to say

that I had driven him out of New Zealand and he had got a job in Lesotho, in Africa, flying a Cessna 206 on scenic charters and big game hunting trips. A few months later it was reported that he'd been killed, along with five others when he was carrying out a night charter and entered IMC. His engine failed and, even with his instrument rating, he became disoriented and lost control. If we were ever to meet in an after-life, I am sure he'll be looking angry and still making excuses, while waiting for me to say, "I told you so, I said that you'd become the meat in the sandwich!"

Flying over 8/8 fog in a single engined aircraft is always dangerous, because, while engine failures are somewhat rare, if you are unlucky enough to get one, you are going to have to handle the emergency and land into terrain and obstacles that you can't see. And, whilst doing that, fly the aircraft on instruments. Can you do this – ABSOLUTELY NOT!

With no clear air in which to recover underneath, you have Buckley's chance of survival. Lastly, if you are in an aeroplane without an artificial horizon, or other means of determining roll/bank. You are absolutely doomed from the point the engine fails, and are just waiting for the aircraft to carry you to the accident site!

Happy Flying

-------ooOOoo ------

"Lemon Pickers Needed" - ad in the Shepparton Times newspaper.

Ms. Sally Mulligan read it and decided to apply for one of the jobs that many Victorians are not willing to do.

She submitted her application for a job as a Lemon Fruit Picker but seemed far too qualified for the job. She has an Arts Degree and a Masters from Melbourne University. For a number of years, she had worked as a social worker and also as a school teacher.

The farm owner studied her application, frowned, and said, "I see that you are well educated and have an impressive resume. However, I have to ask you, have you had any actual experience in picking lemons?"

"Well, as a matter of fact, I have," she said... "I've been divorced three times, owned two Fords, voted twice for Daniel Andrews and once for Anthony Albanese."

She started work yesterday.

Badland Aircraft Debuts "Thump Air" Engine For its F1 Ultralite

By Steve Ashby, Kitplanes, July 2023

Badland CEO Chris Deuel with the new Thump Air engine at the AirVenture Ultralight field.

Badland Aircraft of Truman, Minnesota, premiered its F-1 (named for the Fujita tornado scale) Ultralight in 2015. Since then, they have sold 29 kits and have 9 aircraft flying. For the past year, Badland has been working on a new and more powerful four stroke engine for the F-1, based on a Honda single cylinder, 420cc industrial engine. Badland's CEO, Chris Deuel, developed the engine using a custom cam, engineered crankshaft, roller rockers and titanium valves. He also designed, fabricated and perfected his own 2.55 to 1 re-drive for the engine. The result is a light and reliable powerplant that puts out just under 40 horsepower and 270 pounds of thrust, using a three-blade ground adjustable E-Prop.

Thump Air single cylinder four stroke engine, with Badland re-drive, based on a Honda industrial engine.

Deuel has run the new engine through 35 hours of reliability testing, 15 of which were in the air on the F-1. He could not be happier. He reports the "Thump Air "engine is so powerful that he has to adjust the propeller to keep from exceeding the 55 knot ultralight top speed restriction. Duel also noted an 800 fpm climb in the F-1 with a 180 pound pilot.

The Badland F-1 kit comes fully welded with everything necessary to fly firewall aft, including the fabric, basic instruments and even new Badland Bush tires (also manufactured in house). With the new engine, Badlands promises the final product will come in at 247 pounds and fly just like a Cub. An electric starter will add 4 pounds. The wings are designed to fold, allowing the entire aircraft to fit into a 20' X 8-1/2' box trailer. The airframe kit is priced at $16,175 and the firewall forward kit, including the Thump Air engine and E-prop will sell for around USD$5000-7000.

F-1 (named after the tornado scale) ultralight with folding wings.

For more information, visit *www.badlandaircraft.com*

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FLY-IN Invites Looming

WHERE	EVENT	WHEN
Murgon (Angelfield) (YMRG)	Burnett Flyers Breakfast Fly-in	**Find Next Planned Event";** **Sunday, December 10th.** **Confirm details at:** **http://www.burnettflyers.org/?p=508**
Watts Bridge (YWSG)	Watts for Breakfast	**Last chance for 2023. Starts 0730 'til 0930.** **Come and EAT.** **See https://watsbridge.com.au**

The Days of Our Lives (Feedback from a Flying Instructor).

By Rob Knight

Nigel, a cashier in a shoe store, was a visitor from the UK who arrived with the express desire to work and learn to fly whilst he was here as it was so expensive “back home”.

Short on educational qualifications, and long on chips on his shoulders that the world had to run the way he wanted it, Nigel was a Pom from hell! New Zealand wasn’t England so we Kiwis had better shape up and remember the respect to which he was entitled.

I first met him after his second dose of stalling. After the flight, Nigel had abused his instructor and the CFI passed him to me as there was an obvious personality clash. I made a booking with Nigel for the following weekend and arranged to discuss him with the instructor with whom he had been flying. Our discussion was not reassuring.

Nigel’s attitude was that, if the instructor was any good, he didn’t have to do any work, it was just a case of him being an empty vessel waiting to be filled by his trainer. He couldn’t grasp that he had to demonstrate the handling that I was encouraging him to do, and, if he couldn’t do it - well that was my fault – I wasn’t good enough.

After a couple of flights, I reported to the CFI that Nigel was impossible and that we would best deal with his disruptive and entitled attitude by discouraging him. The CFI disagreed but wouldn’t take him on himself – I was delegated to continue and do my best.

Nigel’s first solo flight was typical of the man. He was instructed, as always, to do one single circuit, to make it a full stop and pick me up waiting on the side of the runway. But he ignored the instruction and did four, instead. This upset the next man booked in the aircraft and he went home without his flight. I was left trying to explain to the CFI what the matter was. He did agree to give Nigel a “rocket” for disobeying instructions but still refused to take the student on himself.

For my own sake, I got Nigel to write out the required handling skills and the levels of competence required for a PPL. He had no ability nor desire to maintain competence. All he had to do in his mind was to have each exercise logged and competence didn’t come into it. Therefore, as we completed the required exercises for the PPL, he had great difficulty maintaining what he could do well last week, and demonstrate it again this week. His logged lessons mounted, his logbook filled with hours, but his competence was always well behind. Eventually I got to the last exercises in the syllabus but by then he had about 75 hours logged. This tally, caused by his attitude, was exceptionally high, and his old arrogance was never far below the surface that I was at fault because he couldn’t retain things.

The last straw came when I was doing a pre-PPL flight test revision exercise. In this the CFI required that we shut the engine down (stopped the prop) and gave the student the controls with a request to land the aircraft back onto Ardmore’s centre grass. It was standard procedure.

Nigel sat there – frozen - staring wide-eyed at the stopped prop in front of him. Frozen, he drifted across the airfield and was shortly to enter Auckland International’s approach control airspace, when I took control back. With the Tower’s agreement, I landed on a non-duty runway and taxied back to the Club

In the briefing room Nigel demanded I sign his flight test application which I declined so he threw a chair across the room at me. His aim was off, he missed me and damaged the whiteboard.

The Club *(at last) terminated his membership and he completed his training elsewhere in New Zealand. He acquired his NZPPL and returned to the UK. Two years later he and his passenger were killed in a PA38 when he spun in – he was teaching a friend how to spin, according to the UK report.

------ ooOOoo ------

The Unconventional, Bizarre Bell Airacuda

By Jason McDowell, Flying Mag, September 5, 2023

The Bell YFM-1 long-range and heavily armed escort fighter featured twin pusher engines housed in glazed nacelles.

An Airacuda in flight, with vacant nacelle seats and the second control yoke in the stowed position. [Credit: U.S. Army Air Forces]

Larry Bell, founder of the Bell Aircraft Corp., now known as Bell Helicopter, entered the aircraft manufacturing industry with a unique bang. After dropping out of high school in 1912, Bell worked for various aircraft companies, including Martin and Consolidated, before starting his own company in 1935. Rather than beginning with a conservative, basic aircraft type, he opted to respond to a military contract by proposing one that was so unconventional it bordered on bizarre.

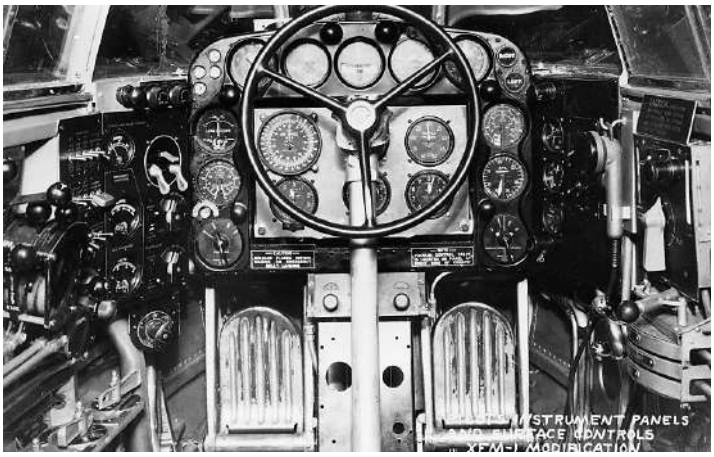
An Airacuda in flight. [Credit: U.S. Army Air Forces]

That aircraft was the Bell YFM-1 Airacuda, a long-range and heavily armed escort fighter designed as an interceptor and bomber escort. It was part of a newly emerging category of aircraft containing models described by FLYING in 1941 as “virtually impregnable fortresses of themselves, yet maintaining considerable manoeuvrability and striking prowess which the big bombers lack.”

The design and configuration of the Airacuda was like nothing the industry had ever seen. The twin pusher engines were housed in glazed nacelles, each of which contained a crewmember, for a total

of five. And while most of the 15 examples built were taildraggers, three incorporated tricycle gear—a cutting-edge aircraft development at the time.

In the fuselage, the pilot was accompanied by two other crewmembers. Seated in close proximity was an individual who handled three duties—copilot, navigator, and fire control officer. This multitasking expert was provided with a stowable control column and pedals to help fly the aircraft and was typically the one in charge of aiming and firing the various gyro-stabilized cannons and machine guns bristling from the airplane. In the back, a third crewmember handled radio communications and manned .50-caliber machine guns mounted in side pods to protect the aircraft from aggressors approaching from the rear.



The Airacuda cockpit. [Credit: U.S. Army Air Forces]

Out in the engine nacelles, the remaining two crewmembers had somewhat simpler tasks. While they had the ability to aim and fire the .30-caliber machine guns in their respective nacelles, their usual duty was simply to reload them. Of somewhat more significant concern was what they would do in the event they had to bail out and fall through the path of the propellers churning the air immediately behind. While various sources refer to explosive bolts intended to jettison the propeller blades prior to bailout, the flight manual only refers to an emergency feathering procedure in which the electric props would feather and stop in six to eight potentially very long seconds.

Almost immediately upon making its first flight in September 1939, it became clear the Airacuda engineers had perhaps bitten off a bit more than they—and the flight crews—could chew. With 1,150 hp Allison V-1710 V-12 engines, the 21,625-pound aircraft could achieve 268 mph in high-speed cruise and reach a service ceiling of 29,900 feet. However, the flight control characteristics and single-engine handling were atrocious and would now be considered far too dangerous to approve for production.

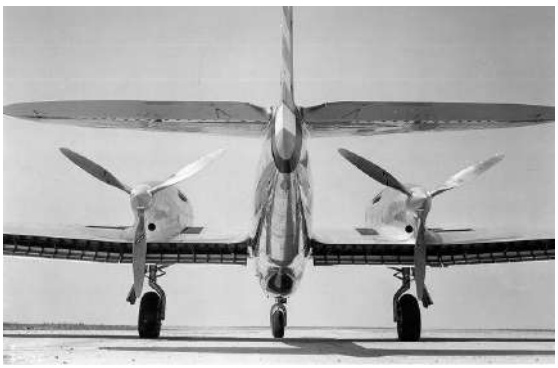
The flight manual made no attempt to hide the unforgiving handling characteristics from pilots, warning that “due to close proximity of propeller to tall surfaces, a sudden reduction of power of one engine either through an engine failure or excessive movement of one throttle will result in a much more violent and immediate control reaction than on multiengine, tractor-type airplanes. Failure of one engine may result in a spin unless the other engine is retarded or trim tab control adjusted immediately.”

It went on to include some concerning limitations: “In case of failure of one engine the other engine should be retarded immediately and the throttle of [the] good engine advanced gradually as trim tab control is adjusted to counteract turning moment. With proper adjustment of [the] trim tab, airplanes can be safely flown on one engine. Single-engine practice flights will not be engaged in below [10,000] feet. This airplane should be flown only by experienced multiengine pilots.”

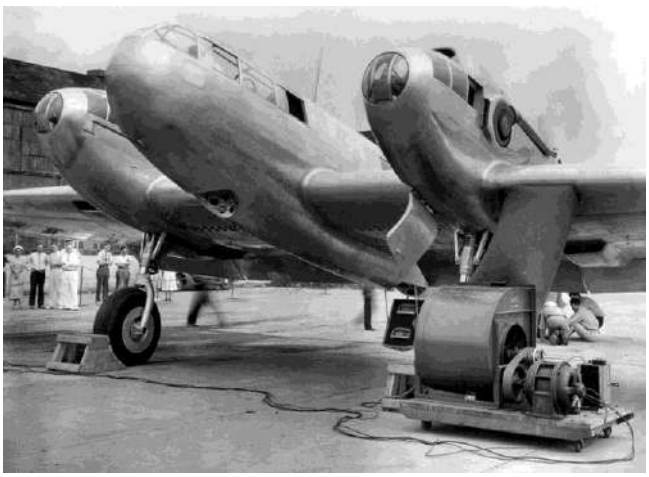
To provide sufficient electrical power for the various power-hungry systems, such as the targeting gyros, Bell designed the airplane around a 13.5 hp, 2-cylinder, four-cycle piston auxiliary power unit (APU) mounted in its forward belly. It ran at a constant speed of 4,000 rpm and powered the majority of systems, including the aforementioned propellers. Contrary to many reports, the APU

was, in fact, not the sole source of electrical power—the right-side engine was fitted with a backup generator to provide emergency electrical power to the aircraft in the event the APU failed.

Compounding the challenges of the Airacuda's unconventional design was insufficient engine cooling. When idling on the ground for extended periods, the aircraft required special fan units with custom ducts that fed into the wing leading-edge intakes to prevent the engines from overheating. This also led to some operational difficulties in flight.



A unique rear view of a tricycle gear Airacuda displays the pusher engine arrangement. [Credit: U.S. Army Air Forces]



Electric fans, ducted into the Airacuda's leading-edge intakes, provided much-needed cooling air during engine runs on the ground. [Credit: U.S. Army Air Forces]

Ultimately, no further examples of the Airacuda would be manufactured, as the combination of long-range bombers, such as the B-17, and traditional fighter escorts, such as the P-51, proved effective in the war. Two Airacudas were lost in accidents, and unfortunately, all remaining examples were scrapped by 1942.

While the small fleet never directly contributed to the war effort, Bell learned valuable lessons from its design, testing, and production. To keep the engines positioned forward, for example, and thus maintaining a proper center of gravity, each Airacuda engine incorporated a 64-inch driveshaft extension. The vibration and harmonics involved in such an extension are not trivial, and this experience likely helped refine similar extensions utilized in the later P-39 Airacobra and P-63 Kingcobra, both of which were manufactured in the thousands.

Jason McDowell

Jason McDowell is a private pilot and Cessna 170 owner based in Madison, Wisconsin. He enjoys researching obscure aviation history and serves as a judge for the National Intercollegiate Flying Association. He can be found on Instagram as @cessnateur.

------ ooOOoo ------

Keeping up with the Play (Test yourself – how good are you, really?)

1. A pilot, about to line up and take-off on runway 15, assess the wind from the windsock is blowing 180/20 knots. What crosswind component should he anticipate?

   A. 5 knots.
   B. 8 knots.
   C. 10 knots.
   D. 14 knots.

2. The graticule on a Lambert's Conical Conformal aviation chart is oriented according to which of the following?

   A. True North/South/East/West.
   B. Magnetic North/South/East/West.
   C. North/South/East/West adjusted for deviation.
   D. North/South/East/West adjusted for variation.

3. What causes advection fog?

   A. A clear skied night, and a breeze, colder than the dew point, blowing at 2 to 8 knots.
   B. A cold dry breeze blowing across a moist surface warmer than the dew point.
   C. A cloudy night and calm winds with a temperature colder than the dew point.
   D. A warm moist breeze blowing across a surface colder than the dew point.

4. An aircraft flying on a heading of 100˚ is encountering a tail wind of 235/30. If it's IAS is 100KIAS, which of the following is closest to its ground speed?

   A. 70 knots.
   B. 85 knots.
   C. 115 knots.
   D. 130 knots.

5. A pilot weighing 82kg enters and maintains a balanced 60˚ banked torn, maintaining height, what would his weight be whilst in the turn if he could be weighed?

   A. 84kg.
   B. 164kg.
   C. 122kg.
   D. 178kg.

See answers and explanations overleaf

If you have any problems with these questions, See Notes below or call me (in the evening) and let's discuss them. Rob Knight: 0400 89 3632 (International +64 400 89 3632), or email me at kni.rob@bigpond.com.

1. C is correct.

As rules of thumb, the following are guides:

- A wind blowing at 30˚ to the runway direction will have 50% of its strength as crosswind component, and 85% of the wind value as headwind component.
- A wind blowing at 60˚ to the runway direction will have 85% as the crosswind component, and 50% of its strength as its headwind component.
- A wind blowing at 45 to the runway direction, will have 70% of its strength as headwind and 70% of its strength as crosswind.

See https://e6bx.com/wind-components/

2. A is correct.

The graticule on a Lambert's Conical Conformal aviation chart is oriented according to true North.
Also See: https://en.wikipedia.org/wiki/Lambert_conformal_conic_projection

3. D is correct.

Advection fog is caused by a warm, moist breeze blowing across a surface colder than the air's dew point.
Google "fog types"

4. C is correct.

- Compare the heading to the wind direction. This will indicate the wind is blowing from an angle at 60 to the reciprocal of the heading (280˚),
- 60˚ off the reciprocal means that 85% of the wins speed is tail crosswind and 50% is tailwind component.
- 50% x 30 = 15, so the groundspeed will be 15 knots faster than the IAS = 115 knots.

5. B is correct.

In a 60 banked turn, maintaining height, the acceleration will be 2G. Thus the pilot would weight 2 X 82kg = 164.

------ ooOOoo ------

Brisbane Valley Flyer -

Aircraft Books, Parts, and Tools etc.

Contact Rob on mobile – 0400 89 3632

Tow Bars

Item	Condition	Price
Tailwheel tow bar.	Good condition	**$50.00**

Aircraft Magnetic Compass (Selling on behalf)

Item		Price
Wired for lighting • Top of panel mount, • Needs fluid replenished.		**Open to Offers**

Propeller Parts

Item	Condition	Price
Propeller spacers, Assorted depths, all to fit Rotax 912 UL/ULS propeller flanges	Excellent	**$100.00 each**
Spinner and propeller backing plate to suit a Kiev, 3 blade propeller, on a Rotax 912 engine flange.	Excellent	**100.00**

For all items, Contact me - on mobile – 0400 89 3632

Or email me at:

kni.rob@bigpond.com

Aircraft for Sale

Kitset - Build it Yourself

$1,780.00 neg

DESCRIPTION

All of the major components needed to build your own aircraft similar to a Thruster, Cricket or MW5.

- Basic plans are included, also
- Hard to obtain 4" x 3" box section, 2 @ 4.5 metres long.
- Wing spar & lift strut material - 6 tubes of 28 dia. x 2 wall.
- 20 fibreglass ribs plus the moulds,
- 16 spar webs plus the moulds,
- 2 fibreglass flat sheets for the leading edges - 4 metres long x 1.1 metres wide.
- All instruments including,
- A Navman flow meter,
- A Powermate rectifier regulator,
- A ballistic parachute,
- A 4-point harness,
- Set fibreglass wheel pants, and
- More.

Box sections and tubes

Flow Meter, Navman, Ballistic Chute, etc

A very comprehensive kit of materials

Ribs, tubes, spats, etc

Colin Thorpe. Tel: LL **(07) 3200 1442**,

Or Mob: 0419 758 125

Thruster T85 Single Seater for sale.

$9,750.00 NEG

Beautiful classic ultralight single seater taildragger Thruster for sale; to good Pilot. Built in 1984, this is a reluctant sale as I inherited Skyranger V Max and two aeroplanes are too many for me.

The aircraft at Kentville

New Engine Rotax 503 Dual Ignition has only 10

Fuel tank

Instrument panel

Details

Built - 1991	Serial Number - 312
Model - Thruster 85 SG	Rego Number – 10-1312
TTIS Airframe - 638	Original logbooks - YES
Engine - *NEW* Rotax 503 DIUL	Next Annuals due – 05/11/2023
TTIS Engine – 10 hours	Propeller – Sweetapple, Wood, 2 Blades (as new)

Instruments - RPM, IAS, VSI, ALT, Hobbs meter, New Compass, CHTs, EGTs, Voltmeter & fuel pressure gauge

Avionics - Dittel Radio 720C and new David Clark H10-30

Aircraft is fitted with Hydraulic Brakes. Elevator Trim. Landing Light. Strobe Beacon. Auxiliary Electric Fuel Pump.is in excellent mechanical condition and the skins are “as new”.

Offers considered. Call Tony on 0412 784 01

Sky Dart Single Seat Ultralight for Sale.

$4,500.00 NEG

A single seat, ultralight, Taildragger. Built in 1987, this aircraft has had a single owner for the past 18 years, and is only now I am regretfully releasing it again for sale. I also have a Teenie II and am building another ultralight so I need the space.

The landed Sky Dart III rolling through at YFRH Forest Hill

TTIS airframe is 311 hours, and the engine, TTIS 312 – is just 1 hour more. Up-to-date logbooks available. 2 X 20 litres tank capacity. To be sold with new annuals completed.

It is easy to fly (for a taildragger), and a great way to accumulate cheap flying hours.

Call me to view, Bob Hyam, Telephone mobile 0418 786 496 or Landline – 07 5426 8983, or Email: bobhyam@gmail.com

Landed at McMaster Field after my flight back from Cooma just West of Canberra. In the cockpit with me is GeeBee, my dog

Single Seat T84 Thruster, disassembled and ready for rebuild.

I have a T84 single seat Thruster project in my hanger at Watts bridge.

The fuselage is on its undercarriage, the wing assemblies are folded up and the skins are with them.

Included is a fully rebuilt Rotax 503 dual ignition engine and propeller.

And, most importantly – the aircraft logbook!

Asking price $5000.00

Contact John Innes on **0417 643 610**

Aircraft Engines for Sale

Continental O200 D1B aircraft engine

Currently inhibited but complete with all accessories including,

- Magneto's,
- Carburettor,
- Alternator,
- Starter motor,
- Baffles and Exhaust system, and
- Engine mounting bolts and rubbers.

$POA

Total time 944.8 hours. Continental log book and engine log are included.

Phone John on 0417 643 610

ROTAX 582 motor.

Ex flying school, TTIS 600 hours, and running faultlessly when removed from aircraft for compulsory replacement.

No gearbox, but one may be negotiated by separate sale if required.

Interested parties should contact…..

Kev Walters on Tel. **0488540011**

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