BRISBANE VALLEY FLYER

April - 2021

BRISBANE VALLEY SPORT AVIATION CLUB INC

www.wattsbridge.com.au
www.bvsac.org.au

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From the Club

Hello everyone,

At the general meeting on the 6th March 2021 the meeting was suspended for the Annual General meeting to take place.

The President opened the meeting and gave his report and talked about the year to date. What a year it was and the New Year is already looking positive. He thanked the members for the support and commitment toward keeping the club running smooth and friendly.

The Treasurer gave the financial report and it was noted that the club is in a very good financial position at the moment.

The Election of the office bearers was then conducted.

There was no nomination for the position of President and, as per our constitution, we require a President to function. The meeting voted to amend the constitution to read “To allow the standing president to nominate again from the floor at the AGM”, and remove the clause limiting the President to a two-term period. This was passed with a unanimous vote of the members present.

Peter Ratcliffe was then nominated for the position of President.

Only one nomination each for the positions of Treasurer and Technical Officer was received. These were Ian Ratcliffe and Bill Oates respectively.

The past Vice President, Vern Grayson, and the past Secretary, Jackie Daley, did not re-nominate this year. A nomination was received from John Innes for the position of Vice President to replace Vern Grayson. No nominations were received for the position of Secretary.

This year the position of Social Director was taken up by Jackie Arnold. This is the first time that this position has been filled and the Committee looks forward to many new social ideas for the club.

A vote was taken for each of the positions listed above, and all nominating members were elected with unanimous votes.

As there were no nominations for the position of Secretary, the President will fill this position as Acting Secretary until a replacement nomination can be found.

The President thanked the departing Vice President and Secretary for their help over the past year.

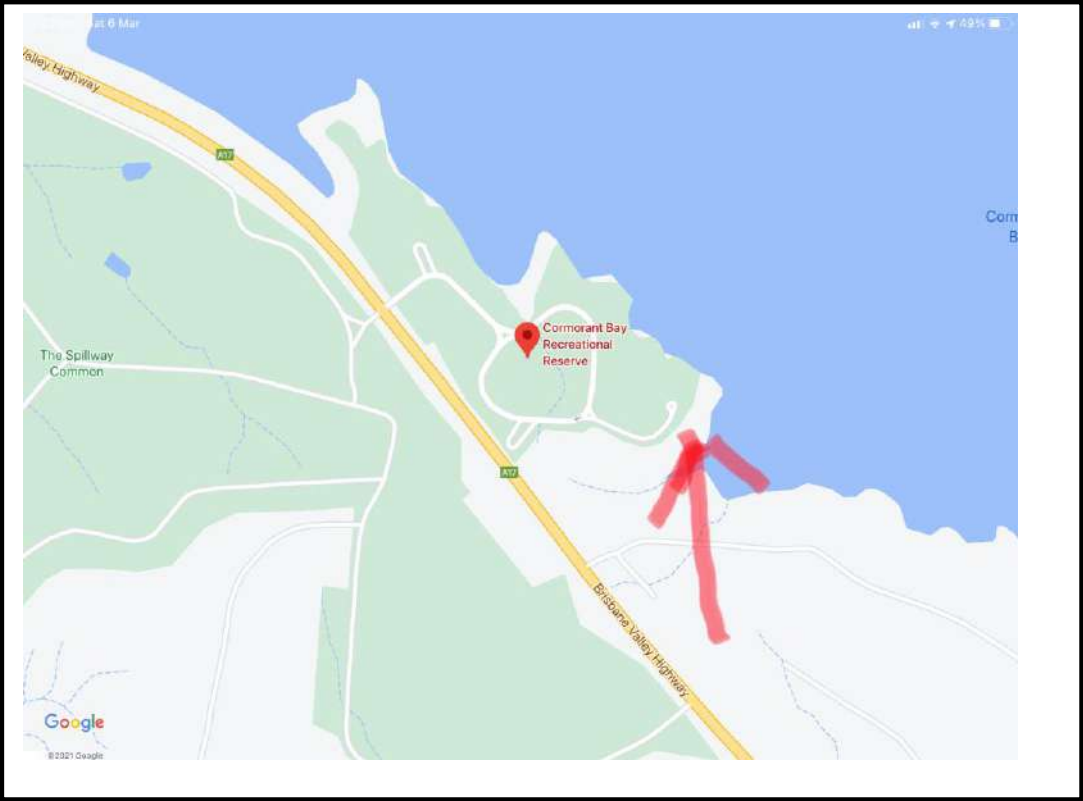
It was also decided at the meeting to appoint Doug Stott to a position of Membership Officer to maintain the membership list.

The meeting was then closed and the general meeting resumed.

Peter Ratcliffe, BVSAC President

NOTICE:

The next BVSAC monthly meeting is scheduled for April 10 2021 and is to be held in the picnic area at Cormorant Bay on the Wivenhoe Dam as depicted below



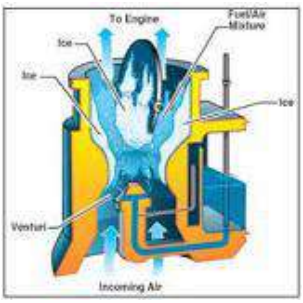
Induction Ice

By Rob Knight

Last month I reproduced a previously published piece on carburettor icing. It has now been pointed out to me that there are a number of light and ultralight aeroplanes operating nowadays without carburettor induction systems, and that I should not tacitly suggest that such icing issues were restricted to carburettor-fitted machines only.

Carburettor ice is merely one form of induction icing – induction icing being any formation of ice restricting the flow of air into the engine for combustion purposes. All air used in the combustion process of an internal combustion engine must pass through the induction system for that air to be used for combustion.

Induction icing consists of any ice accumulation that blocks the venturi, air filter, ducting, and/or fuel metering device. Carburettor icing (specifically, ice that forms in the carburettor) occurs when the drop in air pressure, and/or the drop in temperature due to vaporization of fuel inside the venturi, causes rapid cooling of moisture-laden air near to, or colder than, the freezing point of 0° C. Note that the process of ice formation is due to deposition, the process where ice forms directly from vaporised moisture and doesn't pass through the liquid process: the deposits form out of the free-flowing air.



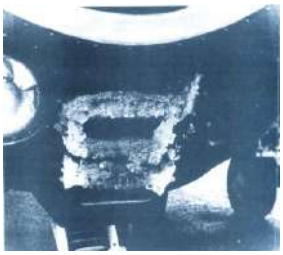
Cutaway Carburettor showing ice accumulation

Induction icing is generally classified in three types:

- Impact ice,
- Fuel evaporation ice, and
- Throttle ice.

Impact Ice.

This is formed by the impact of moist air at temperatures between -10°C and 0°C on air scoops, throttle plates, heat valves, etc. It usually forms when visible moisture such as rain, snow, sleet, or clouds are present.



Impact ice on Mooney cowling

Most rapid accumulation can be anticipated at -4°C. This type of icing can affect fuel injection systems as well as carburettor systems and is also the main type of icing hazard for turbocharged engines.

Impact icing on airliner side window

Note that, although not part of induction icing, impact Icing can also collect on pitot heads and pitot tubes and provide flawed Airspeed indicator readouts as caused the Air France flight 447 to crash into the Atlantic killing 228 people. It can also collect on or about any other protuberances on the aircraft structure.

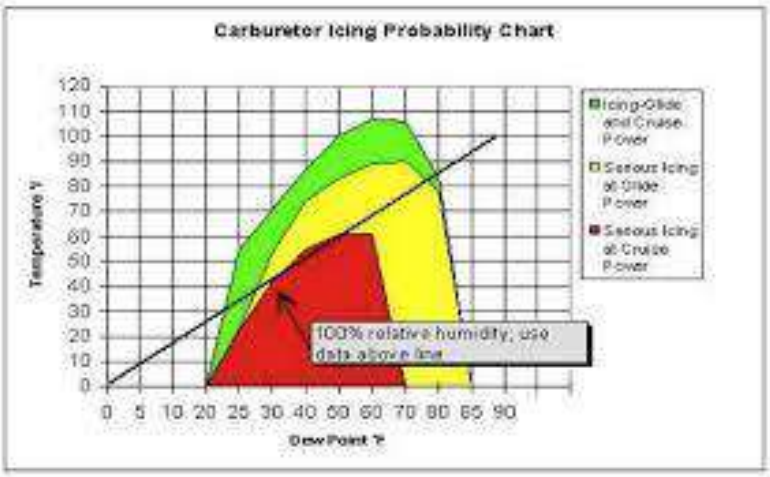
Fuel Evapouration Ice.

Primarily a part of carburettor icing, this forms at, and downstream from, the point that fuel is introduced into the carburettor when the moisture content of the air freezes as a result of the cooling caused by fuel vaporisation. It generally occurs between +4°C to +27°C, but may occur at even higher temperatures. It can occur whenever the relative humidity is more than 50%.

Throttle Ice.

This is the most common, earliest to show, and potentially the most serious, form of carburettor icing. It is formed at or near a partly closed throttle valve (AKA the "butterfly valve"). The water vapour in the induction air condenses and freezes due to the venturi effect cooling the air as it passes the throttle valve. Since the temperature drop is usually around 3°C, the optimum temperature for forming throttle ice is between 0°C to +3°C although a combination of fuel and throttle ice could occur at higher ambient temperatures.

Although "carburettor icing" is most likely to occur when the temperature and humidity are in the ranges indicated above, it can also occur under conditions not depicted. More detailed charts are available on-line.



Sample of a Carburettor Ice Probability Chart

Carburettor icing is much more likely at reduced power, so select carburettor heat before power is reduced for the descent, especially if you are intending to lift off again e.g., a practice forced landing or helicopter autorotation.

To recap - the primary difference between carburettor and fuel injection is that fuel injection atomizes the fuel through a small nozzle under high pressure, while a carburettor relies on suction created in the intake manifold to draw the fuel into the airstream through a venturi (carburettor).

The first signs of carburettor icing are normally:

- For a fixed pitch propeller - a reduction in available power measured by RPM,
- For a constant speed propeller - a reduction in manifold pressure.

If left untreated:

- Rough running engine,
- Increasing vibration,
- Further loss of performance,
- ENGINE STOPS due to fuel starvation.

Need I say more……..?

Leaving carburettor icing, induction icing on aircraft not fitted with carburettors frequently occurs at the engine air intake filter. If carburettor heat (which draws air from within the engine cowling) is not selected, or is ineffective, power loss will ensue. When air is near freezing, movement of water molecules over an object such as the air filter may sometimes cause instantaneous freezing.

Impact icing occurs when ice forms on the exterior of the aircraft, blocking openings such as the air intake for the injection system, on the air intake, and blocks or partially blocks, the entry of air into the induction system. Aircraft fitted with fuel injection systems utilise an alternate air system. This ducts air from inside the cowling, bypassing the normal air filter, for combustion use. Thus, if the external air intake ices up, selecting the alternate Air Source control to ON, will allow the engine to continue operating. Also note that impact icing may also form on the cowling intakes and cause engine overheating.

For aircraft with fuel injected engines, the alternate air control is reserved for emergency procedures dealing with power loss; either full or partial power loss, suspected due to manifold pressure loss. However, it is checked for operation on every run-up.

Happy Flying

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From the Archives: Checkout in a Spitfire

By Air Facts Staff

The Supermarine Spitfire is one of the most beautiful airplanes to ever take to the skies, and an effective one too, with a sterling record during the Battle of Britain. In this trip into the Air Facts archives, Nancy Miller takes us inside the famous Spit for a look at what it was like to fly one. She should know—she logged nearly 1,000 hours ferrying airplanes for the RAF.

Once upon a time, as the war clouds threatened but before the storm had broken, the prototype of the now famous British Supermarine Spitfire was flown – in March 1936. This plane, more then any, has captured the imagination of most people and has licked the pants off many Germans. It is credited, with its close pal the Hawker Hurricane, with having saved Britain in 1940. It has always aroused the admiration and awe of any pilot or aviation enthusiast. The very clean lines, the graceful elliptical wings, its appearances in all attitudes have moved many people into saying it is one of, if not the most graceful, beautiful aircraft in the world.

Now there isn't much that can be said about military aircraft – you know why. But since there are so many American military pilots (and no doubt many others) who want to fly it (the greatest compliment), I might be able to give an idea of how the Spitfire behaves without giving away any important secrets. After all, the German test pilots probably know more about it than I do.

Getting in isn't bad except on a muddy or icy day. You step directly onto the port wing and draw yourself up by grasping where the small hinged door swings down. The cockpit is narrow and a 200-pounder would have a tight squeeze. There are metal runners beneath the rudders so that you can rest your feet. The rudders themselves are double-decked and you can use either level. They are adjustable but being an awkward operation, I often curse long-legged test pilots. The seat is adjustable up and down only. The cockpit is fairly full of gadgets but not nearly so much as American fighters with all their little switches. There are two main operations which upset most Americans, (1) the brakes, and (2) the landing gear lever.

The stick in the Spit is topped by a circular rim about an inch in diameter, with a lever just behind it. Using your right hand, you pull the lever like a squeeze-grip and this operates the brakes. The harder you pull, the stronger the brakes. You differentiate which brake is to be used by applying slight rudder. Full rudder is not necessary and you don't have to stretch your feet out of shape.

Those who have never used this system find it confusing at first, but once used to it, it is excellent, as you can feel the whole action. British pilots usually dislike hydraulic toe brakes at first and find them quite confusing. Both systems have their merits.

As to number two, the landing gear lever, this is on the right side of the cockpit and necessitates a change of hands to operate. This explains the little up and down jerk a Spit sometimes does just after take-off. More embarrassing is when the throttle slips back just when you put the left hand on the stick and the right on the lever. The throttle tension wheel, unfortunately, is poor and the throttle may be tight half-way and loose at full travel.

The instrument dashboard isn't too overloaded. Dead ahead is a full blind – flying panel, the six instruments well set out and the big master compass below the dash. The few engine thing-a ma-jigs

are at the right, and the flap control, elevator trim tab indicator, landing gear lights, mag switches, at the left. The flap control indicator is unusual. It's just a flat piece of metal and moves either up or down on a pivot. There is no intermediate position.

The throttle and pitch levers are on the left in a good position. On most Marks, the mixture control is automatic and there's a cut-out lever outboard of the throttle, which is moved forward when starting and for automatic running, and back to shut off.

There is no tail wheel lock, the wheel being strongly self-centring. Two wheels left of the seat are the trimmers. There is no rudder indicator, one turn from either end being neutral. The elevator trimmer, the larger wheel, has an indicator like a rate of climb, the middle position being neutral. There are other gadgets around, radio, emergency air bottle for the landing gear, jettison equipment, oil dilution, etc., but all we're trying to do is check out, not fight in it.

Spitfire cockpit

With parachute on, harness fastened, cockpit check completed, you call "all clear" and "contact." Starting isn't difficult but you certainly wish you had another pair of hands! Switches on, throttle cracked, wobble pump (if fitted), doper, press two buttons (booster coil and starter), catch the engine on the doper (right hand), plop the mixture lever into automatic and use the throttle with the left hand. It's a hectic few seconds! The full-throated roar is sweet music. It doesn't take too long to warm and run-up, and it's difficult to taxy far on a warm day (if any!) without the radiator (glycol) temperature zooming to 120 degrees Centigrade, at which time the engine must be shut off and left to cool. To run up, it is necessary to have two men lie on the stabilizer so that the plane won't nose over.

Taxying calls for care as the long-nosed Merlin and Griffon engines block the forward view. Zig-zagging is easy by use of coarse (full) rudder, and a bit of throttle, and very little brake is needed except in a cross-wind. The narrow landing gear scares most newcomers, but it is absolutely amazing how well the gear stands up to all sorts of landings especially in a cross-wind. I have taken them in with 20-25 mph winds at 45-50 degrees off the runway and with the proper correction they have set down three–point quite nicely. There's only a slight tendency to weathercock and it can be corrected by coarse rudder or a touch of the squeeze brake.

That wing……..

The take-off has need of a gentle, firm hand, not that used for a B-24 Liberator. The elevators are very sensitive. You can open up quickly except in later Marks where the torque is more pronounced. Very little rudder will keep a straight course and only the slightest forward pressure on the stick will put the Spit "on its mark." There is no forward view but I never had

any either when my 200-pound instructor sat in the front of my Piper Cub!!

You open up to plus eight- or ten-pounds boost, which is around 48 to 52 inches of manifold pressure. I have taken some off at plus four, but it isn't so nice. I have also taken one off at full boost, and my, did she jump! You can feel the power of the engine, like most fighters. If there's a nice long runway, it's a marvellous feeling to keep her smoothly on the ground until she just refuses to be a groundhog any longer. She wants to fly, so you let her ease off the ground without a ripple. Just a bare tip-of-the-finger sends her airborne; there's no need of hugging the stick or pulling back firmly. The Spit likes to fly. All you have to do is give her a hint and she'll do the rest.

As you leave the ground you switch left hand to stick, and right hand to the "C"-shaped landing gear lever. You press down a second, then left, up, right, and release. The wheels flatten out in the wings very quickly and the lever snaps automatically into an "idle" position. The Spit builds up to 160 mph rapidly, and the throttle and pitch can be adjusted to plus four and 2600 RPM. She climbs well, although the nose is a bit high.

On any take-off, crosswind or otherwise, the Spit unsticks at an amazingly slow speed and it's almost impossible to drag it off too slowly or drop a wing.

Adjusting the throttle to zero boost (30 inches) and 1900 RPM, you can relax and look around. Since you aren't out to lose yourself in Britain, we'll change the routine from the ferry job to some turns and a landing. By the way, the British call the practice of take-offs and landings, "circuits and bumps," and it's strangely accurate. Bumps indeed!

Now remember, finger-tip touch is all that is necessary, and most of the time you don't need rudder as the aileron gives a good turn. In a medium turn, little back pressure is used, but a tight turn requires a firm hand. When you bank there's a feeling of remote control, almost as if your unconscious leaning into the turn did it instead of the stick. Aerobatics are pleasant but stalls and spins need plenty of altitude.

Coming into the circuit, you drop your boost a bit to slow down to 160 mph. Then change hands, push the gear lever up a second, left, down, right, and release. As the gear comes down, you check the green light, and the lever which slips into "idle" position. The nose drops a bit, but the trimmer is handy. Because of the blind nose, the Spit, as with other fighters, should be brought in at an angle to the runway so that the pilot may judge his approach and have a clear run. The Spit has a flattish, nose-up glide with flaps up at slow speed. Flaps bring the nose down but not enough for a straight approach. A nice 180 degree "U" approach can be started at 800 feet. If you find yourself coming in high and straight, you can make gentle S-turns with confidence.

Well, you are buzzing in at 110 and you just don't think it should be any slower. But a bit of pressure soon changes your mind, as you zoom up. For Spits I to V, you can approach with a bit of motor at 85-90 mph, with a slight increase on later Marks, as they are heavier. Initial approach is 95, slowing to 85-90 for the last 200 feet of altitude. Quit jerking the stick—looks like a porpoise! Just relax and use only a couple of fingers on the stick. Break the glide gradually, using the same light touch and as she nears the ground, slide your hand around the stick and brake lever. You can feel the ship want to keep flying, and on a rough day, you must be quick on the controls in order to judge the actual "touchdown." Just as she settles, you must pull back firmly, but not too far. Due to the high nose, most people don't like

to see it too high, and thus a tail first landing is rare. It's somewhat like a Fairchild 24. You break the glide and continue to pull back, but just at the end you must suddenly pull faster, in order to get the tail down. That's about the only quick motion ever needed in a Spit.

As she touches and rolls, she rocks slightly. Directional control is excellent by slight, quick, firm use of the rudder. A touch of brake can be used but it's usually not necessary—especially if you're not used to that type of brake. The nose blocks the forward view, but you can keep straight by glancing off about 30 degrees to each side. The run is not long except for later, heavier Marks in a calm wind.

An ad from the same issue shows what civilian aviation looked like in 1945.

Now if you had decided, as most newcomers do, that 85-90 mph felt too slow and brought it in a 95-100, you'd be glad of a long runway. The Spit doesn't want to sit down and if you give her a bit of rope, she'll float all the way down the runway. You'll make a half-dozen porpoising up and downs two feet off the runway before touching. It's surprising how easy it is to land a Spitfire safely, even on its wheels, but how difficult it is to make a perfect three-pointer.

So, you taxy zig-zag back to dispersal, after flaps up, radiator open (mechanical on some, automatic on later Marks), gyro caged, clear the engine at 1000RPM for 30 seconds, then pull the cut-out ring or bring the mixture lever into idle cut-out. Switches off, petrol (gas to you) off, and that's that. The engineer will disconnect the battery, as there's no main battery switch in the cockpit.

Nearly always someone asks "How does the Spit compare with the P-51 Mustang?" Well, I've flown many more Spits than P-51's, and naturally I'm a bit prejudiced. There are other aircraft like a 51 in the air, such as the Grumman Hellcat (F6F) and Corsair (F4U), both being light and yet with a similar touch to the 51. But there's nothing like a Spitfire!

Looking up in Jane's All the World's Aircraft for 1943-4, I see where the Allison-powered P-51 had a top speed of 370 mph, and the Spit V was 369. Spans had a difference of about two inches, horsepowers were within 100 of each other. The P-51 weighed about 1400 pounds more loaded, had less wing area, was longer in the snout, and landed faster. The Spit is rounded and graceful, the P-51 clipped and proud. There should not be any comparison because it just depends on the individual pilot whether he likes one better than another.

You may never see or fly a Spitfire but if you do, look at it and treat it as the high-spirited trusty thoroughbred that she is. She likes to fly as much as we do.

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An airline pilot gets Re-acquainted with piston engines—and engine failures

by Alan Murgatroyd

After learning to fly with the Royal Air Force I hardly touched a light aeroplane, or flew solo, for the next 40 years. Four engines and three or four crew were the norm, and with a demanding occupation, busy family, and limited cashflow—it's a myth that the hump on the Boeing 747 was for the captain to sit on his wallet—meant that recreational flying was a rare event. So, when the CFI of one of the local clubs became too incapacitated to fly, and suggested that I buy his single seat, VW-powered Druine Turbulent Microlight, it was a whole new ball game.

No longer would I have a flight engineer to complete the pre-flight, exterior inspection, start the engines, manage the fuel, monitor the temps and pressures, and pass my coffee from the stewardess, amongst other things; nor a co-pilot to read the checklist, talk to ATC, load the navigation waypoints, copy the weather, listen to the ATIS and keep me amused. I would be on my own. Scary!

An airplane is an airplane, right?

I arranged to collect ZK-CQC from a nearby grass airfield where I planned to re-acquaint myself with a tail-wheel—that really was a 40-year gap—and get to grips with this tiger that I had grabbed by the tail. But no sooner had I handed over my final cheque to complete the purchase, then the sky darkened, rain clouds threatened, and I decided to run before the storm and go back to home base.

Brakes on, switches on—contact! The delivery pilot swung the prop then dashed back to his accompanying aircraft and flew off before the rain set in. So, there I was thrown in at the deep end, so gingerly taxied onto the runway, remembering to weave left and right to see ahead.

Checks complete—what checks? Well, I guess it was wise to ensure that the fuel was still turned on, no trim, no mixture, but the choke was pushed in, altimeter reading field height, oil pressure and temp and cylinder head temp were in the middle of their respective ranges, so were presumably within limits, no flaps, harness secure, RPM increased with throttle, and the engine didn't stop when I turned each mag off, compass was indicating runway heading, and control surfaces waggled obligingly. Deep breath, full throttle, stick neutral, bit of rudder, tail came up, bit more rudder, experiment with a bit of back pressure on the stick—and we're off! I was committed now; the thing had to be landed somewhere, so why not go home and beat the rain?

On arrival the wind was right across the long runway, so not wishing to test my 40-year-old tailwheel skills and a crosswind at the same time, I landed on the short grass runway. After only one small bounce I was trundling along quite happily with the stick held firmly back, but the hedge was getting close so it was time to experiment with the brakes. Big mistake. The Turbulent brake pedals stand out of the floor between the rudder pedals, but there is only space for one foot at a time, which is supposed to apply both brakes, but of course they never grip evenly, so a turn is induced and it is essential to correct this quickly. That means one has the option of twisting the sole of the foot to create a different pressure on the pedals, or apply the opposite rudder.

Murphy's Law dictates that the rudder to be applied is the one with the foot that is being used for the brakes, so it is off with that foot, on with the other foot, dab of rudder, overcorrect, change feet,

opposite rudder, overcorrect, change feet. The corkscrew result of these ballet steps was observed by the flying school CFI, which doubtless has a bearing on the present opinion of GA instructors that microlight pilots are cowboys—proficient in square dancing.

I finally got everything under control, put the aircraft in the club hangar. And had a beer.

I had to wait a few days for the weather to improve, but finally got to play with my new toy. I perfected the technique of completing two touch and gos from each approach—with 1500m available and less than 300m needed each time, and no flaps or trim to reset, this is hardly a challenge. Three-point landings, wheel landings, side-slipping to final, calm summer evening take-off on 17, land on 31, circle to 35, circle to 13, circle to 17. Hey! This is almost as good as taking a 747 into Hong Kong. Kids—don't try this at home.

After about three weeks, a club member asked me to fly his wife in the club Cessna 152 with a camera, to photograph their own aircraft air-to-air. On landing there was film to spare and they offered to reciprocate with photographs of me and CQC, so off we went—formation flying now—another memory from the past.

They landed back ahead of me, and when downwind for the short grass runway (but being used to 3,000m of sealed, international runways), the 460m available looked awfully short, and I considered myself too close and too high, so flew most of the circuit with the throttle fully closed. (Yes, I did remember carburettor heat.) The runway is guarded by a stand of tall trees, over which there is a permanent downdraft, almost like a standing wave. Being correctly positioned on short final, the downdraft required a touch of throttle—at which point the engine stopped. S#^t!

Check fuel on, switches on, keep airspeed, fly the aeroplane—don't stretch a glide. To the right of the threshold was a fairly long paddock, but unfortunately a pair of trees were in the way. I was convinced that I couldn't squeeze through and would take the wings off, so it was down to ground level and low speed, but in fact I got through with room to spare. Following the best landing of my life, I hit a rut and dinged the prop. I got out cursing heartily, set some chocks, swung the prop, and the engine started immediately. Shutting down, I then walked over to the flying club where my friends were expecting me to taxi in behind them instead of slouching dejectedly across the field, dangling my headset. We all went back, the farmer obligingly removed some of his wire strand fence posts, and we pushed CQC back to the hangar. And had another beer.

Glider pilots land out all the time, so what's the big deal?

"Carb icing," said the bar room pundits, sagely, but I didn't really believe that. I know one can never say it isn't that sort of day, but it wasn't that sort day—I didn't think. Over the next few weeks, I had the prop repaired, the engine, carb, magnetos, fuel pump, and fuel lines checked over and via the Internet contacted the UK Tiger Club, who run a fleet of Tiger Moths and Turbulents.

"Yes," they said, "It's happened to us too, we recommend a small trickle of power be held right into the flare."

I now have a large red line painted on my RPM gauge, beyond which I never reduce—ever—until over the hedge.

After a few confidence-reassuring flights, I decided to see how high I could get—over, or near to, the airfield of course. Achieving 10,000 ft. I was cold and bored—it took a long time—so decided to go home. I pulled the power off and the CHT dropped back to the stop. Can't do that. I restored some

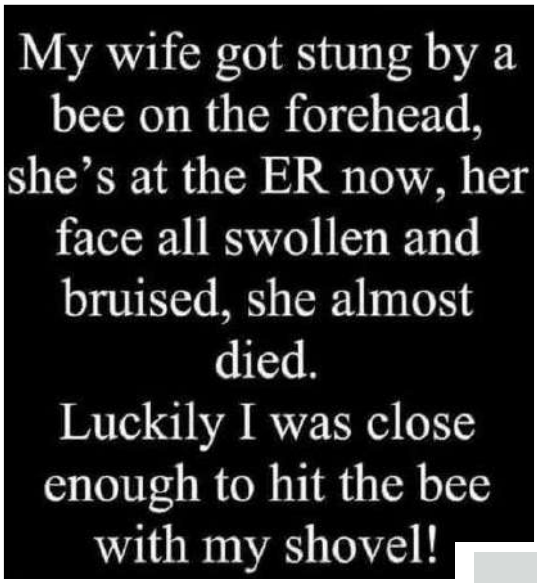
power and dropped the nose with similar result. Hum? Eventually it took me nearly as long to slowly descend with some power on, as to climb.

Starting CQC is always a challenge; those who have owned VW cars will recall having to keep the starter turning and pump the throttle until the thing sprang into life, but with no electric starter, not even an impulse magneto, swinging the prop will only give you one compression at a time, at a time, at a time etc. The engine has to be started with half choke selected, and if successful one should then close the choke and open the throttle, if the engine stops. Not warm enough.

In retrospect I think I let the engine get too cold and had I grabbed a handful of choke, it might have sprung back into life—maybe. I'm not inclined to try and prove the theory and anyway I was too busy flying the aeroplane—always the first priority.

What have I learned (re-learned)? Always assume that the engine is going to stop at the worst possible moment and have a cunning plan ready. It isn't the first engine failure I've experienced, but previously I had a few spares to rely on!

Fly the aeroplane—they actually glide quite well. And remember, glider pilots always have a forced landing and they survive. Usually.



The Real Reasons we don't have Flying Cars

By Rob Knight

For over a century, people with wishful thinking have imagined the future to be filled with flying cars. They've been seen in movies, concepts from auto manufacturers, and even fully functioning prototypes. Even Ford came close to purchasing the Taylor Aerocar for distribution in the '40s. But the fact remains, these vehicles aren't ready for mass production. Yet, the technology available today is advanced enough to make this a reality. So, what's holding us back?

From an engineering standpoint, flying cars have two opposing sets of requirements. Aircraft must be light and narrow to fit with aerodynamic requirements and generate sufficient lift. Cars, on the other hand, must be wide and heavy enough to stay centred on the road, and have sufficient road traction. Also, whilst parts like side-view mirrors are necessary on the road, in the air, they create undesirable drag. This decreases airspeed and range and requires more fuel to fly any given distance. Meanwhile, wings and rotor blades can throw off a car's power-to-weight ratio. The heavier they are, the bigger the powertrain necessary to drive. But, if the power train is too heavy, the car won't fly. Vice versa, if the wings are too small, the car won't get airborne.

Aeromobil 1

Developing a vehicle that meets this balance is expensive and time consuming. That's because, unlike with cars and planes, there is no blueprint for flying cars. Slovakian company AeroMobil has a flying car that's taken over 30 years to make a reality. The car has required four different iterations.

The first, Aeromobil 1, was simply a concept designed by co-founder Stefan Klein in the 1990s. In theory, it could fly and drive, but was bizarre-looking and far too big to be used in traffic. This led to the second version, which was built in 2010 when the company was established. It had collapsible wings, could fit into a regular parking space, and had a range of 877km on the road and 700km in the air. It first flew in 2013.

Aeromobil 3

But even then, the company was already developing its first official prototype, the AeroMobil 3.0. It featured upgrades that would be necessary on a production car. That includes a reinforced body made from carbon fibre, advanced avionics, and patented steering controls. It could transform from a car to flight mode in under three minutes. Despite these advancements, the 3.0 crash-landed during its 2015 test flight. Test pilot Klein lost control, and the vehicle went into a spin. Photos showed that the vehicle's steel framework was destroyed. If the company wanted to sell this car to the public, it would need to be much safer.

Aeromobil 5, VTOL

So, they returned with a model almost 363kg heavier and a monocoque structure stronger than its predecessor. It also included an upgraded parachute system and dual-stage airbags. This newest prototype took five years, cost over $US20 ($26) million, and required 10,000 hours of test flights for the company to be confident it was ready. After three decades of research and development, AeroMobil is awaiting government certification. The vehicle will cost at least $US1.3 ($2) million and require a pilot's licence. That's

a pretty steep buy-in, and at that price, it's unlikely you will see vehicles like these in mass production anytime soon.

Another manufacturer in the Flying Car race is Terrafugia with its current model, the Transition. Now owned by Chinese interests, this manufacturer, too, has spent decades in research and development getting to the level of design and performance they have achieved to date.

Terrafugia transition - as a car

The Terrafugia Transition is a light sport, roadable aeroplane under development. Powered by a Rotax 912ULS piston engine, with a carbon-fibre airframe, the intended flight range is 425 nm using either MOGAS o 100LL avgas at a cruising speed of 93 knots. It is fitted with a Dynon Skyview glass panel avionics system, an airframe parachute, and an optional autopilot.

Terrafugia transition – in the air

On the road, it can drive up to 70 miles per hour (110 km/h) with normal traffic. The Transition production prototypes folded dimensions of 6 ft 8 in (2.03 m) high, 7 ft 6 in (2.29 m) wide and 18 ft 9 in (5.72 m) long, are designed to fit within a standard household garage. When operated as a car, the engine power take-off near the propeller engages a variable-diameter pulley CVT automatic transmission to send power to the trailing-suspension mounted rear wheels via half-shafts powering belt drives. In flight, the engine drives a pusher propeller. The Transition has folding wings and a twin tail.

To integrate flying cars into our daily routine, we have to entirely rethink our approach to them; exactly what companies like Uber, GM, and Hyundai have done with VTOLs. VTOLs (vertical take-off and landing aircraft), resemble helicopters or drones rather than cars, and many VTOLs feature non-road-worthy wheels. Companies are investing in them to function as "air taxis" to fly passengers between landing areas.

It appears that Flying cars will inevitably be relegated to something that just couldn't work, they are most likely to be replaced by the emerging eVTOL aircraft.

Whilst eVTOL machines are engineered similar to existing military aircraft, obviously some modifications are necessary to operate in crowded urban areas -- like electrification. Besides eliminating fuel emissions, electric powertrains have less complicated mechanics than jet-powered models. But that doesn't mean eVTOLs are easy to produce. They'll need to use distributed electric propulsion, meaning they'll have a redundant number of rotors and motors. Unlike a helicopter or a plane, if one rotor fails, the other will keep the aircraft flying. This is necessary when hundreds of them will be flying around crowded areas.

Rolls Royce's entry into the eVTOL market

This type of propulsion would also contribute to quieter flight. While helicopters use large rotors to generate maximum lift and prevent stalling, the small rotors used by eVTOLs would be mounted on wings and capable of tilting forward like a plane's propeller. This would allow them to spin much slower. This setup, along with the electric motors, could make eVTOLs at least five times quieter than helicopters.

EVTOLs seem like the simplest solution, but they require an entirely new infrastructure to function. Projects like Uber and Joby Aviation's Elevate are currently designing "skyports" to be built throughout cities. These are elevated parking garages that feature landing pads on the top level. While fairly compact, one can cost as much as $US150 ($194) million. Communication is also an unsolved, but crucial, element.

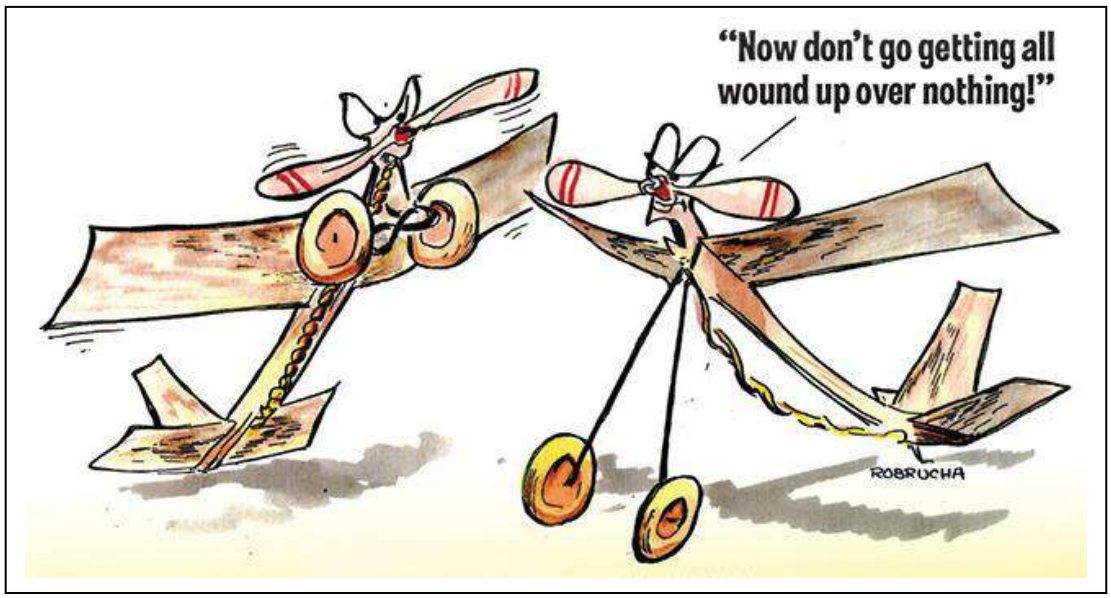
EVTOLs need to digitally communicate with each other and nearby air towers. At the moment, all of this has to be done verbally, which is efficient and safe with only a few aircraft, not a mass fleet. Available at a limited capacity for commercial drones, digital communication allows aircraft to instantly share their flight-plan data. For air taxis to be sustainable, this limited capacity will need to expand.

While the technology exists for both these types of vehicles, it's the logistics preventing them from being a reality. Between certification and the infrastructure, they'll need to function in our current world, it'll be a long time before flying cars are a routine way to travel.

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

FLY-INS Looming

11 April 2021	Murgon (Angelfield) (ALA)	Burnett Flyers Breakfast Fly-in
23 April 2021	Shute Harbour (YSHR)	2021 Air BP Whitsunday Fly In
13 June 2021	Murgon (Angelfield) (ALA)	Burnett Flyers Breakfast Fly-in



What Has 57 fuselages and 120 wings?

Ultimate Aero's Thai Fly-in Breakfast, of course!

By Rob knight

There was an excellent turnout to Nigel Arnot's Ultimate Aero's Thai Fly-in (or drive-in) breakfast. Held on the 20th of February, he appeased the weather Gods sufficiently to provide one of the best flying days of the year to date, and conditions were almost perfect.

57 aircraft attending, of which 6 were vintage biplanes.

The party started at 0800 (in theory) but, when I appeared shortly after that, many visitors had already arrived.

Nigel was out and about, and a team of enthusiastic parking marshals guided the arriving aircraft into the parking areas. Mel Perkins, Nigel's very able co-pilot, ran the food and breakfast area in the hangar where either a Thai breakfast was on offer, or a standard Aussie bacon, eggs 'n' beans breakfast was optional.

Brekkie's up, everyone

The parking areas filled rapidly and the aircraft types covered the smorgasbord

of GA and RA Queensland aircraft. The oldest was probably the Genairco, VH-UOD, the DH82a look-alike from Buderim, that was born in 1930. The Waco, VH-EGC, rolled out in 1938 and Tiger Moth VH-FAG was a war baby, being delivered in 1941.

Genairco nose on left, David Crowe's DH-82a right

Chipmunk, the De Havilland DHC-1 - Series 22, VH-SSJ, came along after the war, in 1950, which makes it a young 71 years old.

VH-SSJ, the "Chippie", also from Buderim

WACO ECG-8 Special. This one resides at Boonah

Altogether there were four DH-82A Tiger Moths on display.

The newest arrival was probably the Italian-built General Avia Construzioni Aeronautiche F22R. A very classy aeroplane with its sleek lines, beautiful colouring , CSU, and tuck-away gear. Other GA aircraft attending included Cessnas of many parts of their family, and Pipers including a PA-38 Tomahawk and PA-32 Cherokee six.

The ultralight/RA-Aus fraternity were also visible with Drifters, Foxbats, a Jabiru or two and a Minicab. Phil Hargreaves, who's "Just Aircraft", Super STOL" machine bush machine was parked appropriately in the rough. The two airborne image of the parked aircraft were taken from Phil's machine.

Phil Hargreaves Super STOL

An excellent day for flying

Food, excellent food – the most important part of the day (after the aircraft, of course).

The first fly-in after Covid began, and it was a great success. Thanks Nigel and Mel

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

Details Emerge on Breakup of a Van's RV-7

By Rob Mark

Aircraft structure failed after pilot exceeded the aircraft's never-exceed speed.

The Van's RV-7s are designed to be operated in both aerobatic and normal category.

The Civil Aviation Authority of New Zealand says an amateur-built Van's Aircraft RV-7 broke up in mid-air during a January 1, 2018, VFR flight, killing the pilot and passenger. The CAA believes the pilot lost control of the aircraft after possibly conducting an aerobatic manoeuvre that far exceeded the RV-7's never-exceed speed (VNE). The aircraft had departed Whangarei aerodrome—about 60 miles north of Auckland—at about midday.

ZK-DVS

The CAA said at about 12:16 local time, the RV-7's EFIS recorded the aircraft in a steep 70-degree left bank with a nine-degree nose-down pitch. The airspeed was recorded as 148 knots. RV-7 aircraft are designed to be operated in both aerobatic and normal categories. After a short descent, the aircraft returned to its initial altitude of 4,500 feet. A minute later, the EFIS recorded that the aircraft had entered a 70-degree right bank with a nose-up pitch of 20 degrees, while the airspeed had dropped to 132 knots. A few seconds later the bank angle increased to 130 degrees with a 20-degree nose-down pitch.

At 12:17:13, the nose pitched down further to 60 degrees with the aircraft in an approximately 60-degree right-bank as the airspeed climbed to 183 knots. Six seconds later, the RV-7's nose dropped to 30 degrees below the horizon as the airspeed rocketed to 244 knots. The RV-7's never-exceed speed is approximately 200 knots. Four seconds later the aircraft rolled into a 40-degree right bank with a 30-degree nose-down pitch and an airspeed of 99 knots. Shortly thereafter, the RV-7 broke up in flight and later impacted local terrain.

The pilot held a private pilot-airplane certificate and an ATPL for helicopters with an instrument rating. Anecdotal evidence gathered by the CAA indicated the pilot enjoyed flying around clouds and on the day of the accident some clouds were present at and below the altitudes at which the aircraft was operated. Whether this was a joy-ride flight to show off, a pilot practicing aerobatics, or some sort of inadvertent encounter with weather, was never determined. The CAA learned the pilot did not hold an aerobatic rating, which requires a special course of training in New Zealand. Witnesses said the pilot did not like to conduct aerobatics and that he was generally a "straight and level" pilot who would "climb to seek smoother air," when required.

The safety investigation could not conclusively determine if the aircraft inadvertently entered cloud during one of its manoeuvres. If, however, an inadvertent IMC encounter did occur, it is possible the pilot experienced spatial disorientation, leading to the aircraft entering an unusual attitude.
The CAA said they also could not determine from the physical evidence, who was in control of the aircraft when the in-flight breakup occurred. Witnesses said it was not a general practice for the pilot to relinquish control of the aircraft to passengers during flights.

From the evidence available, safety investigators learned the pilot had not conducted steep turns of 70 degrees before the accident flight. The CAA also believed it was possible the pilot became startled at the aircraft's behaviour and misapplied some flight control movements that were appropriate to helicopters in order to recover from the steep bank and dive he encountered.

The CAA said the vertical stabilizer and top half of the rudder were located approximately 2,000 feet south-east of the main wreckage site, while the right wing was located approximately 1,500 feet south-east of the main wreckage. The top half of the rudder was still attached to the vertical stabilizer at the top and center hinges but had fractured in half just below the center hinge. The rudder had split open at the trailing edge riveted joint; the fractures consistent with overstress. However, there were no indications of progressive failure. Numerous parts of the rudder, including the rudder balance weight and lower skin section, had separated from the main rudder structure and were considered consistent with rudder flutter.

During this investigation, the CAA worked with both the US NTSB and the Transport Safety Board of Canada to identify RV-7 accidents with similar wreckage signatures to the accident airplane. One RV-7A accident occurred in the United States, the other in Canada. In both accidents, the damage to the rudder structure and the separation of the vertical stabilizer was determined to be consistent with rudder flutter leading to structural failure of the vertical stabilizer attachment points. An NTSB report stated, “Failure of the horizontal tail first would cause the airplane to pitch down rapidly, producing air loads on the upper surface of the wing that were sufficient to fail them in negative overload.” The damage to the right wing of the accident aircraft was consistent with a downward failure in negative overload.

The CAA did not assign a probable cause to this accident, saying only that, “Accidents can occur whenever the aircraft limitations and or the pilot’s own capabilities are exceeded.”

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

Structural failure is an ever-present threat to aircraft and personnel safety, even without operating the aircraft outside of the designer/manufacturers’ limits as provided in the appropriate Flight Manual.

I have never operated an aeroplane outside the limits specified. However, I have been flying since 1961, that’s 60 years, and in that time, I have suffered/experienced eight structural failures in aeroplanes in which I have been the pilot in command. One was on AG ops and was caused by a foreign body but the rest were when light was under the wheels.

The first failure in this category was a wheel lock-up when landing a Fletcher after a sowing run. I had only just started operating from the strip and the grass was long and wet with a classic New Zealand dew covering everything. It was the third trip and, landing uphill, there was a sharp noise from the left as I touched down. The aircraft swing to the left a bit and then slid partly sideways up the strip. Adding power and right rudder helped stop the edge coming too close and I ended on the flat area at the top still partly sideways. As I landed, I had picked up a metre or so of rusty barbed wire which had wrapped itself around the tire and wheel assembly, locking the wheel. Some fencing pliers cut away the tightly bound wire and we were operational again. However, had the surface not been so slippery, I could easily have gone over the edge and the drop-off was both steep and extensive.

The next was in a Cessna 172, ZK-BWN. It was the afternoon on the day before I was to sit my first instructor rating, a “C” category ticket to begin my instructing career. I was flying solo from the right seat and practicing maximum rate turns when the right-side control yoke broke

apart in my hands. The aircraft's nose dropped and the bank steepened but I was able to correct things using the remaining stub on the shaft. I changed seats in flight and returned to Rex Aviation at Ardmore to have a replacement fitted for my test the following morning. I still passed the test.

Flying Victa Airtourer 100, ZK-CHF, with a young lady student, on a cloudless and windless morning I noticed a slight buffet begin. We had briefed on medium turns and having done some, were also paying a flying" visit to her parents who lived in Tuakau, a townlet south of Pukekohe in the Ardmore Training Area. I asked the student, but she couldn't feel anything – not surprisingly as Victas were renown for vibrations. We turned back towards Ardmore, about 15mn away and maintained about 2000 feet QNH. The vibration worsened. I checked the mags – both OK. I checked the mixture, but the 0200 was running perfectly. I looked at the airframe out my side but it was as good as that in the left side. We flew on with the vibration getting more aggressive by the minute. I was thanking all the Gods that I could think of that Ardmore was only 10 minutes away because the aircraft was beginning to fly right wing low. A I approached Drury, a commonly used VFR reporting point for re-joins, I told Julia to tighten her harness and, with carb heat applied, I eased to power back and held the wings level – I wanted to see what I had to deal with when I landed.

At about 70 knots the aircraft right wing stalled and it snapped violently right. I sticked forward and rolled out, then called the tower to advising them that I was experiencing some control difficulty and requested an urgent re-join. The tower cleared us No 1 downwind for Runway 21, rescinded all clearances for aircraft ahead, and then cleared us to land on our runway of choice. I settled for the given 21 and made the approach at about 80 knots without flap. I feared that the flap may have come loose and applying them might make the aircraft uncontrollable.

Apart from the speed and the no-flap, the approach was normal until I started the flare when the right wing slammed onto the ground so harshly, I could have blown the tire. We taxied clear and I slid the cockpit canopy back and stood up in my seat. The aircraft looked immaculate. There was no sign whatsoever of anything amiss.

The tower had warned the Waitemata Aero Club, for whom I worked, that we had an issue, and we were met with a throng of instructors and assorted club members. When checking the aircraft, we found that the grit walkway on the starboard side had been replaced at the last and very recent 100-hour inspection. Alas, it had only been glued to the metal skin with standard industrial F2 adhesive which had failed. The gritted material had lifted and folded back causing the vibration and loss of control at low speed. When landing the stiffened material had fallen forward into its correct position and appeared to be perfectly normal and safe. Had a student been flying, I am quite sure that a fatality could have resulted.

My log reminds me that the next failure was doing a type rating with a student on a Beechcraft A36 Bonanza. On climb-out after the initial take-off, the door lock mechanism failed and the door opened with a violent "BANG" and the cockpit filled with dust and fine grit off the floor. The door was on my side (Instructor side) and the student had not flown the type before. We abandoned the departure and followed the circuit and landed. With the student

leaning across behind me to hold the door by its handle as I flew the approach. It would have been a handful if we had been in IMC.

Then I had a problem with a Maule Rocket, ZK-DON. I had taken a group of Waitemata Aero Club members over to Great Barrier Island for a week-long hunting trip. I flew back solo and, to all intents and purposes, the flight was uneventful. That is until I landed at Ardmore. For tail draggers I usually requested and was given access to the grass runways and I landed on 21 Grass. I three-pointed it, and as I touched there was a helluva noise from the back end. Directional control was coarse and I slewed off the runway without hitting anything. When I got out and looked around – there was no tailwheel – I had landed on the broken remains of the tailwheel spring. The wheel had separated from the assembly as I departed Claris Airfield on Great Barrier Island. It was later retrieved, returned and refitted along with the new parts.

The next was potentially the deadliest. I was the CFI at the Rukuhia Flying Club in Hamilton, New Zealand, and the club had a contract to provide a low-level aerobatic display for the Mystery Creek Field day expo that is held most years near Hamilton. On the third day, using our trusty Cessna 150 Aerobat ZK-DJP, I began the sequence at the 1000-foot height I was using and dived towards the crowd to pick up speed (not a lot in a 150). I pulled into a hammerhead beside the crowd, yawed left and dived again to gather speed for the slow roll that was to follow. The roll was to the right and about the time I got inverted, the seat-lock failed and my seat began sliding back. I had to let the yoke go because to pull it would have pulled the nose towards the ground and I only had about 500 feet to spare. I jammed my fingers against the edge of the skylight above me. I stopped the seat and managed to edge it forward until I could touch the yoke with my finger-tips and finish the roll to stagger away back to the airport. My ground commentator was pretty non-plussed as I had no radio contact with him and couldn't tell him what had happened. The failure was a little spring, similar to those found in ball-point pens. It had failed and had allowed the locking pin to fall out when I was inverted and under zero G. Incidentally – I had a wife and two little kids at home and I got no danger money. I got such a fright that I relinquished my low-level aerobatic endorsement and never performed low-level aerobatics again. It was too close to call, that one.

My second to last episode was flying an X-Air 582 at Forest Hill, here in SEQ. As we landed the aircraft lurched left so I applied full throttle for a go-around. The aircraft was even more reluctant to climb than its 65 hp, 2-stroke engine, normally provided. Looking out to the left side showed no wheel attached, so I figured that our next landing would be a short one. We staggered around picking up a little height as we went until we could clear the houses and the tall trees. After a low-level circuit, I landed on the remaining nose and right-side main wheels, holding the left side off with aileron until we ran out of roll control. There was no injury except to the undercarriage leg which had suffered a weld failure in the shock absorbing system allowing the wheel leg assembly to fall apart.

The last is very fresh. It was in December 2020. I had just purchased a lovely little GR-912 Lightwing (55-4448) and was landing at Coominya in SEQ. It was a very rough day, rougher than I'd normally fly in, but it was a positioning flight to the hangar that I had rented in which to store it. In light of the conditions, I wheeled it on and after about 20 feet of roll on the mains, there was a savage bang and the aircraft fell onto its side and changed direction 180

degrees as the left undercarriage leg collapsed. My first thought was that I had mis-judged and landed on the edge of the runway and hit an edge marker, but that was not the case. The bungee suspension had failed. Afterwards, an intense inspection of both bungees showed no sign of external deterioration, but the aircraft had only flown once in two years and, standing without moving for so long, I was advised, was likely the primary cause of the failure. I was further advised by Lightwing that I should thoroughly inspect the bungees every two years and replace them at 5 years. Now I know!!!!

Note that not one of the causes of these incidents could have shown up in a pre-flight. These issues are simply a result of making use of man's ingenuity in mechanical things, and mankind is not perfect. These issues indicate that there is a risk in aviating that we aviators accept or we don't aviate. Just keep on doing good pre-flight inspections to minimise those risks.

Also note that I have only listed actual parts of the aircraft structure that failed. I have also experienced a mixture control cable in a Cessna 177A (ZK-CTC) that pulled out of the panel after I pulled it to commence a simulated forced landing on a PPL flight test. It was intended to be simulated but quickly became a real one. The student made it comfortably into the field so I had to give him a pass. I have also had a carb heat failure which reduced the power, (ZKCKY), and an engine failure due to a loss of oil pressure so the engine seized (ZK-CGM). The pilot response to these is well taught and part of every flight test and BFR, so there is really no issue as far as I am concerned.

Editor

"I'll be honest. Your chances of success are slim."

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

1. During a run-up, a pilot notices that when the carburettor heat is applied, there is no indication of its application. What indication is he looking for, and why does it occur?
   A. A small reduction in RPM caused by the now lean mixture entering the cylinders.
   B. A small increase in engine RPM caused by the now advanced spark timing.
   C. A small increase in engine RPM caused by the new source of now unfiltered and thus unrestricted air entering the inlet manifold.
   D. A small reduction in RPM caused by the warmer and richer mixture entering the inlet manifold.

2. Carrying out a 60-degree banked turn, an aeroplane is subject to 2G. If its take-off weight was 1000 kg, (ignoring fuel burned) what does the aircraft weight?
   A. 500 kg.
   B. 1000 kg.
   C. 1500 kg.
   D. 2000 kg.

3. Upturned wingtips and downturned wingtips, both are purported to reduce induced drag and increase aeroplane cruise speed. How can this be?
   A. They don't – only upturned wingtips increase cruise speed.
   B. They both reduce the effective angle of incidence during cruise.
   C. Both devices reduce spanwise flow and this reduce the induced drag.
   D. They provide a "pocket" of air under the wings allowing a lower angle of attack in cruise.

4. A pilot purchases a classic aeroplane and is preparing to fly it back to his/her home base. The flight time including an hour's reserve, is calculated as being 145 minutes. Given a fuel burn of six imperial gallons per hour and empty fuel tanks, how many litres of fuel must be added to make the flight?
   A. 15 whole litres.
   B. 38 whole litres.
   C. 66 whole litres
   D. 85 whole litres.

5. Radiation fog is likely when which of the following circumstances occur?
   A. Little cloud, high humidity, and a light breeze.
   B. Heavy cloud cover, rain, and a light breeze.
   C. Little cloud, low humidity, and a light breeze
   D. Little cloud, high humidity, and no wind.

See answers and explanations overleaf

- Brisbane Valley Flyer -

Answers: 1, D, 2, A, 3, B, 4, D, 5, C.

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 7400893632), or email me at kni.rob@bigpond.com.

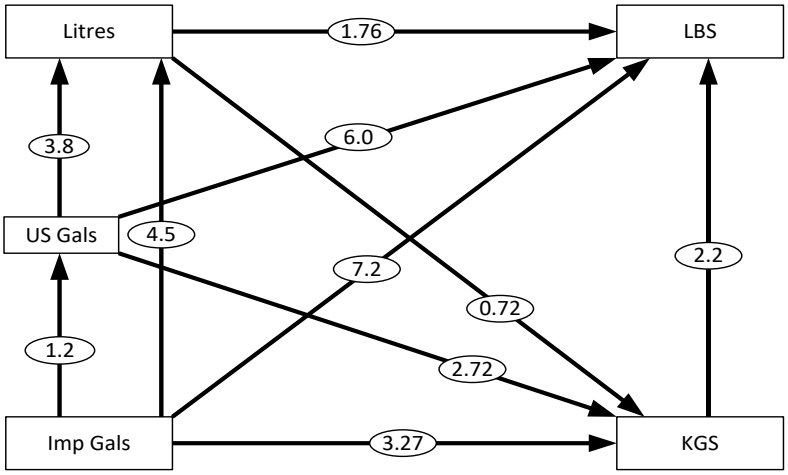
1. D is correct. Applying carburettor heat ducts heated air into the carburettor which causes a richening of the fuel/air mixture. This causes a slight reduction in RPM.
   Google "Carburettor Heat" for further explanations.

2. B is correct. The aircraft is subject to a 2G loading so its APPARENT weight will be 2000 kg, but its mass hasn't changed so its weight remains at 1000 kg.
   In science and engineering, the weight of an object is the force acting on the object due to gravity. Some standard textbooks define weight as a vector quantity, the gravitational force acting on the object. Others define weight as a scalar quantity, the magnitude of the gravitational force. Wikipedia.

3. C is correct Both devices reduce spanwise flow and thus reduce the induced drag.
   See: https://en.wikipedia.org/wiki/Wingtip_device

4. C is correct. 145 minutes (2.41 hours) at 6 imperial gallons per hour = 14.5 gallons of fuel required. Convert litres to imperial gallons fuel use the table in the VFRG which lists a conversion of 4.5 litres/imp gal.

   2.41 hours X 6 = 14.5 imp gals = 66.25 litres.



***To convert: MULTIPLY** by the balloon factor when moving in the direction of the arrow or **DIVIDE** by the balloon factor when moving against the direction of the* arrow.

5. A is correct. Radiation fog requires a near clear sky, humidity, and a gentle wind.
   See: https://en.wikipedia.org/wiki/Fog

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Aircraft Books, Parts, and Tools etc.

Books

Birch & Branson Vol. 1 Basic Flight Training	Pre-owned but excellent condition	**$65.00**
As the Pro Flies (by John Hoyt)	Used but "mint"	**$60.00**
Fate is the Hunter (by Ernest K Gan)	Pre-owned but very good	**$45.00**

Parts and Tools

Item	Condition	Price
VDO Volt Readout instrument	Brand New	**$70.00**
Toolpro 3/8 drive Torque Wrench	As new	**$50.00**
Altimeter. Simple – single hand	As new	**$50.00**
Oil Pressure indicator, (gauge and sender)	New – still in box	**$80.00**
Flight bag. 3 section (2 x zips and 1 x locking flap)	Used but good	**$100.00**

Tyres

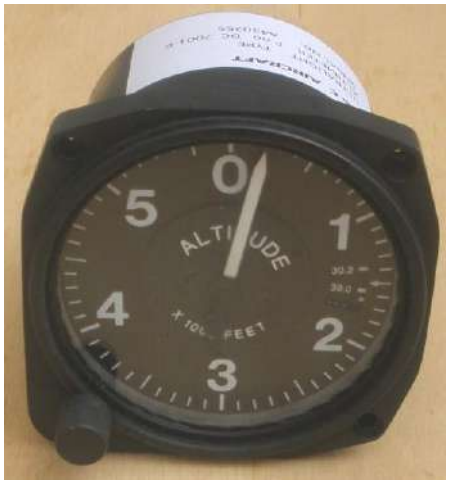
1 only – 13cm X 5.00 – 6 tyre	Unused	**$20.00**
1 only – 13cm 4.00 – 6 tyre	Unused	**$20.00**

Headsets

AvCom headset. Functions perfectly	Excellent	**$150.00**

Contact Rob Knight via either kni.rob@bigpond.com, or **0400 89 3632**.

Altimeter for Sale



This simple altimeter I purchased at Oshkosh is now surplus to my requirements and I am seeking a new home for it.

Its face is absolutely clear, it has never been used, and the subscale is provided in "HG.

It is in as-new condition and certificated. For a copy of the certificate, and/or further details, contact

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

Mob: **0419 758 125**

$120

Aircraft for Sale

¾ scale replica Spitfire

$55,000 neg

This aircraft is airworthy, flown regularly, and always hangared. Registered 19-1993, it is powered by a 6-cylinder Jabiru engine (number 33a-23) with 300 hours TTIS. The airframe has logged a mere 320 hours TTIS. This delightful aircraft has recently been fitted with new mounting rubber, a new alternator and regulator, a new fuel pump, and jack stands

It handles superbly and is available for immediate collection or delivery by arrangement.

Kept at Kentville in the Lockyer Valley, interested parties should contact either:

Kev Walters on Tel. **0488540011** or

William Watson on Tel., **0447 186 336**

Aircraft for Sale

$ Make Me an Offer$

Cobham Cobra

An opportunity to buy a unique aircraft.

I now have a Foxbat, and can't to afford to keep 2 aircraft. The Cobra was advertised for about a year in Sport Pilot, with many enquiries, but no resulting sale. Rather than continuing to spend on hangarage and advertising I decided to de-register it, remove the wings, and trailer it home to my shed. I don't intend to ever fly it again so, make me an offer. It provides very cheap and enjoyable flying.

It is a one-off design, a single seater with a fully enclosed cockpit. It has a 24-foot wing-span, and is powered by a VW engine that provides sporty performance and superb handling. The airframe has logged 653 hours and the engine 553 since installation. It is easy to start, but requires hand-propping.

To see it in action, go to
https://www.youtube.com/watch?v=V5Qx4csNw_A&list=PLpBv2A6hk66Tg9DiCsjEtt4o4o8ygcTju&index=1&t=22s

It cruises at around 80 knots at 11-12 litres/hr. The tanks hold 48 litres so it has a very reasonable range. For my approaches I use 50 knots on my initial approach down to 40 knots on short final. You will want a fair bit of tailwheel time.

For further details contact Tony Meggs on (02) 66891009 or tonymeggs@fastmail.fm

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Slipstream Genesis for Sale **$14,000.00**

Imported and built 2001. Two seats side by side, powered by 80 hp 912UL Rotax, driving a Warp Drive 3 bladed prop. Cruise 70-75 knots. Empty weight 304kg, MTOW 544 kg, Payload 240 kg. Fuel tanks hold 78 litres. With fuel burn averaging 16 litres/hr, still air endurance (nil reserve) is theoretically 5 hours, or 350 nm. Aircraft always hangared. It has been set up for stock control/ mustering or photography, and is not fitted with doors. Registered until 13 October 2021, currently flying, and ready to fly away.

Total Hours Airframe: 144.6. Current, up-to-date, logbook.

Total Hours Engine: 1673.9. Annuals/100 hourly inspection done 01/09/20. Sprag clutch replaced January 2020, gearbox overhauled January 2020.Just undergone ignition system overhaul. One CDI Ignition unit replaced PLUS brand-new spare unit included in sale. Easy aircraft to maintain - everything is in the open. Comes with spare main undercarriage legs, spare main wheel, and nosewheel with other assorted spare parts included.

Fabric good, seats are good, interior is tidy. Fitted with XCOM radio/intercom. Basic VFR panel with appropriate engine instruments, and compass.

An article on this aircraft was published in Sport Pilot, June 2019 issue. See front cover and pilot report within.

Must sell: two aeroplanes are one too many. Quick sale - Fly it away for $14,000.

Contact **Rob Knight tel. 0400 89 3632**, **or email** kni.rob@bigpond.com for details and POH.