BRISBANE VALLEY FLYER

May 2023

Watts Bridge Memorial Airfield, Cressbrook-Caboonbah Road, Toogoolawah, Q'ld 4313.

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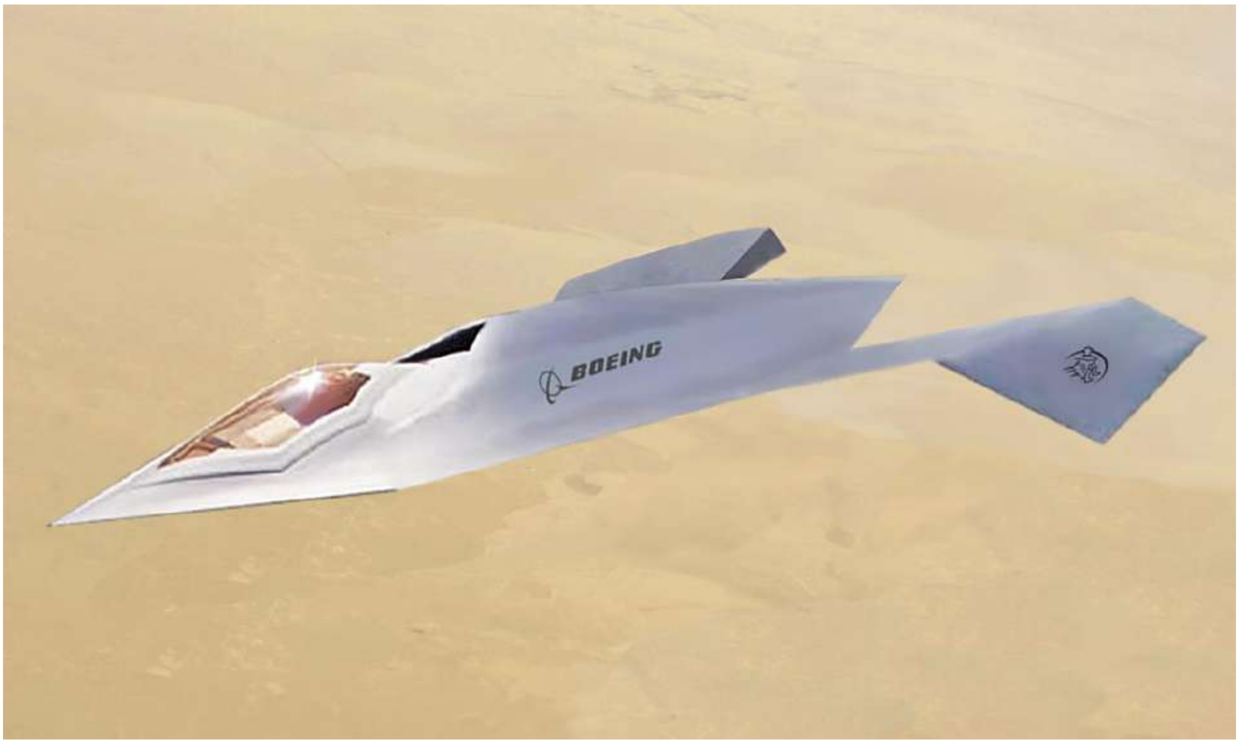

The Boeing YF-118, the Bird of Prey. See page 18

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Greetings members,

Well as the year marches on we now find ourselves in April.

The April meeting was well attended. We have also celebrated Easter and Anzac Day and I hope that you all have a good relaxing time. Not too many Easter Eggs.

Our next meeting is to be held on Saturday the 6th May and we will be holding a small working bee to clean-up the club house, not too much to do just a little bit of painting and washing down the outside of building, and a few other little jobs. This will be after lunch so hope you can make it a long.

As we are having a working bee lunch will be provided free to all attending.

Hope to see you at our meetings for a bit of a chat and some good company.

Best wishes

Peter Ratcliffe
President BVSAC

The Essence of Physically Piloting an Aeroplane

By Rob Knight

What are the basic manipulative skills necessary to fly an aeroplane, really?

I have received vacant looks of total disbelief when I have been talking to nonpilots about how easy flying an aeroplane really is. When I mention that, in reality, there are only four essential manoeuvres a competent pilot must maintain mastery of, I have been immediately found guilty of a gross simplification. However, there is no salesmanship involved. I am speaking the truth: my statement is absolutely factual.

The four manoeuvres are (in no particular order)

- Straight and level
- Turning,
- Climbing, and
- Descending

Think about it – a take-off is accelerating whilst keeping the aeroplane straight (with the rudder). Then, after the wheels leave the ground, the climb is established. Turns may or may not be required whilst climbing. On reaching the desired altitude, a pilot levels off and flies straight and level and unbanked, unless changing direction either laterally or vertically. Then, lastly, the pilot descends to the surface to land, until the flare on the surface when the aeroplane, again flies straight and level as the airspeed dissipates until the aeroplane lands on its wheels. If only we could find it as simple as that.

Let's take a walk through the difficulties that our human natures visit upon us as we move through these four elementary yet oh-so-important exercises.

THE STRAIGHT AND LEVEL EXERCISE.

Often this exercise is the second lesson taught during initial flight training. It is so early in the syllabus because it provides student practice in using the three flight controls that were illustrated in the first lesson – effects of controls thus developing the knowledge the student retains of the basic control about the three axes and practice in manipulating the aeroplane's flight path.

The straight and level flight lesson is aimed at beginning the handling skills of the pilot to divide his/her concentration to allow two limbs to work in a coordinated fashion. The hand, on stick or yoke, controls roll and pitch, while the feet on the rudder pedals controls yaw. It is virtually inevitable that the trainee's brain will never previously have been required to carry out such an exercise unless they have mastered the ability to pat the top of their head whilst simultaneously rubbing their tummy.

Instead, as humans using their limbs to control machines or vehicles, the trainee's skills have been developed around using their hands to control all yaw which is how we control motor vehicles, and, to further compound the confusion, it's their foot that has been controlling the engine power and thus their speed. Now, the student is required to maintain the vertical nose position with pressing or squeezing back on the stick or yoke with one hand, and that same hand keeping the wings level, whilst their other hand controls the engine. Their feet must now stop any yaw and control their aeroplane's straightness against a vague indistinct point of the horizon. This must be the greatest sea-change that has ever been devised!

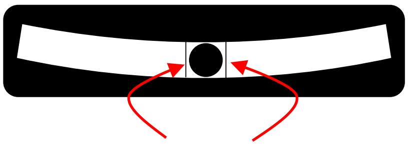
As an examiner, I have checked logbooks post flight-test to seek answers to questions raised during the test, and sometimes have seen just a single 20-minute entry logged as the straight and level training exercise and not another entry in the entire book. It's an impossibility for any trainee to gain the necessary proficiency in such a short time. Some instructors have argued that further training occurred but was unrecorded, being carried out during subsequent lessons. But the performance of the candidate at flight test attested that this whole process was ineffectual as the candidate simply couldn't fly in a straight line. Generally, the attitude holding is OK, but in regard to directional control, a constant swooping or swerving either side of the desired track line was as close as they could get. They had not developed the inherent habit required of pilots of noting a reference point on the horizon and keeping their nose on that point with the rudder using their feet.

This, over the years, has been so frequent that there is no longer any mystery as to why the candidate lacks the necessary skills. The straight and level lesson was either not taught properly in the first instant, or the student developed subsequent bad habits and sloppy ways that were never picked up during subsequent BFR flights. Virtually every pilot trainee drives a car and they will carry the steering habits from the motor vehicle across to the aeroplane unless their instructor has the sharpness to recognise it and the skill to thwart it. But that's just human nature for you!

Some senior instructors have argued that the technique I write of above is tantamount to insisting that pilots "pick up a wing with aileron". Rubbish – I never mentioned any wings – just the nose remaining on a selected point ahead, on the horizon ahead. The flaw in their argument is that, if a pilot uses rudder to prevent yaw, or stops any yaw away from that selected point, the wings will remain level without pilot input. If the aeroplane rolls uncommanded, the pilot has not kept straight with the rudder, and the ensuing yaw has rolled the aeroplane because of the further effects of yaw. Yaw promoting roll is taught in the Further Effects of Controls part of the lesson so it should already be known that, if the wings aren't level, it's too late - the pilot never noticed the yaw and stopped it in the first place. Now he/she has two problems to fix – the aeroplane is no longer flying in the desired direction AND the wings aren't level so the directional change is increasing. The pilot must now deliberately turn back, using opposite bank, and roll out when the nose is again on the selected point. What a silly situation when merely using very small rudder applications to keep the nose on the selected point would have seen the wings remain level and the aeroplane maintain its straight path across the earth's surface. However, people's human nature mixed with old habits make this issue very commonplace indeed. Are you a victim?

<u>TURNING</u>

This is usually the third lesson in sequence in the ab-initio instructor's toolbox. Often logged as "medium turns", initially level turns are covered, and then turns whilst climbing and descending. A bank angle of about 15˚ is desired and the ball within about its diameter outside the index lines is acceptable without comment at this early stage: attempts at balancing the adverse yaw is more important than success at this early stage. After experience is gained, a smooth entry and exit are desired and any imbalance created during the entry or exit from the turn should be seen and immediately corrected. In the turn, at flight test level the ball should not have more than half its diameter consistently outside the index lines.



Also, after the initial medium turns lesson, additional training in turning will include climbing and descending turns, stalling in a turn, and recovery from a spiral dive. These all use the basic techniques covered in the first, basic lesson, but the physical sensations experienced will vary greatly. If advanced training is undertaken, emergency (maximum rate) turns are likely to be included. In such cases, the aeroplane will be turned at its maximum achievable bank angle which will require full throttle to offset the drag because the angle of attack must be very close to the critical angle immediately prior to the onset of the aerodynamic stall.

So, from an examiner's perspective, what goes wrong with such a simple turn exercise?

A number of things, actually, and some are potentially quite hazardous. Lookout often falls victim to casual familiarity, as does the actual precise use of the controls during the turn.

The loss of precise control inputs is often clearly reflected in a pilot's failure to maintain a desired bank angle. He/she becomes so engrossed in fighting with altitude control because of the under or over bank they are too tied-up to see the cause of the issue and resolve it without assistance.

The standard B.L.A.C. (British Light Aviation Centre) Instructor Manual patter for a turn is as follows:

ENTRY:

LOOKOUT – in the direction of turn – above, around and below.
ROLL IN - with aileron, balancing with rudder.
STOP - the roll by removing aileron (and rudder) at the required bank angle.
ADD – back stick pressure sufficient to maintain height (or airspeed) and power if airspeed decays.

IN THE TURN: (Do Not Re-Trim)

LOOKOUT.
BANK ANGLE CONSTANT – use aileron, balancing with rudder.
BALL - in the middle? – if not – step on it.
MAINTAIN HEIGHT/AIRSPEED – Adjust backpressure GENTLY (this the angle of attack).
CHECK EXIT POINT REQUIRED and anticipate necessary action.
REPEAT process until exit point is anticipated.

EXIT:

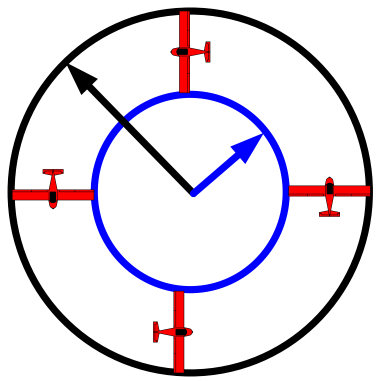
ROLL OUT - with aileron, balancing with rudder.
STOP - the roll out by removing aileron (and rudder) at the wings-level attitude.
RELEASE BACK STICK PRESSURE - and allow the nose attitude to resume the normal level flight attitude or attitude for desired climb/descent as required.
LOOKOUT – around, above and below.

Now to the issues that examiners see in candidates.

There is a tendency, unless removed by the teaching instructor, for students to fail to maintain a constant bank angle. There are two reasons for this:

1. To not remove sufficient aileron to stop the roll in so bank increases in the turn, and,
2. Falling victim to the natural tendency for aeroplanes to overbank because of the airspeed differential between the wing tips during turns. Whilst turning, the inner wing travels a shorter arc than the outer wing tip so it covers a shorter distance in the same time. Thus, the airspeed on the outer wing will be higher and so provide more lift, causing a continued roll into the turn. This will require some out-of-turn aileron (with appropriate rudder to balance) to be maintained to keep the bank constant during the turn.

Note that the amount of out-of-turn aileron (and rudder to balance) needed to maintain a constant bank varies according to whether the aeroplane is level, climbing, or descending.



*The **black arc** is longer than the **blue arc**, so the wings travel at differing airspeeds creating roll into the turn*

Often, when doing remedial training to correct this habit, the success is very rapid and provides joy to both sides of the cockpit. With very little effort, the instructor sees a change of great magnitude in the student's turning skills, and in the recipient, a beaming smile indicates he/she has been touched with a magic wand, and seemingly impossible to attain accuracy in turns has suddenly become achievable. A classic win-win situation.

With the accuracy attainable immediately by maintaining a constant bank angle, airspeed and/or altitude control also become far easier. For any given weight and angle of bank there is ONLY ONE back-pressure to make an accurate turn. Without a constant angle of bank, the required stick back-pressure force cannot be constant so accuracy in maintaining turn parameters cannot be constant.

It is vitally important that roll be stopped at the required bank angle and then that angle be accurately maintained (except for any small adjustments required for turn accuracy). A failure to nail the bank angle and hold it constant will creates such a variety of corrections necessary to maintain height/airspeed, that the turn will automatically become a failure in spite of the pilot's best efforts.

STOP THE BANK AT THE DESIRED ANGLE AND HOLD THAT BANK ANGLE CONSTANT………..

CLIMBING

There are few issues relating to climbing that require any substantial re-education. The few that do relate more to sloppy flying habits than a lack of pilot understanding or training.

Airspeed control is probably the worst issue, and this is frequently the result of a failure to trim correctly during cruise climbs (lazy habits). The second would be maintaining an adequate lookout ahead because so much of the view ahead is obscured by the nose. This is most important in low aspect ratio winged aircraft, such as, to name a few, Piper PA28's, particularly models with the older, squared, short wings, and others such as the Zenair low-winged varieties. Aeroplanes with generally high nose attitudes will require "S" turns in any climb to ensure the area ahead is adequately scanned to ensure no unsuspecting traffic lies ahead.

Perhaps of lesser importance is the issue of keeping the balance ball centred (no slip or skid in the climb). At all times the propeller is turning, the resulting slipstream is impacting more on one side of the keel surface than the other so creates a "out of balance" situation. Propellers turning clockwise from the cockpit create a force pressing the tail right and so the nose left. This will, in turn, create the requirement for a pilot to hold a touch of right rudder in the climb to remain in balanced flight. Powerful engines create the need for a rudder trim device to hold this without pilot input, but most light aeroplanes are without this facility. As "P" factor is a force that adds to the slipstream effect, it is most noticeable in the climb especially when at high power settings and the airspeed is below cruise speed.

DESCENDING

The greatest issues I have seen with issues in the descent relate to the accuracy of airspeed retention whilst in a glide doing engine-out forced landing exercises. For best glide performance, the aeroplane must be operated at its airspeed to achieve its best lift to drag ratio. Given by the manufacturer as a TAS value, unless the aircraft being operated is something like a WW2 fighter, use the TAS value as an IAS on your airspeed indicator and maintain that speed. This will give the best still-air glide range. However, I have observed pilots initially set an accurate airspeed as required, then forget to trim, and as soon as they are distracted by other duties during such an exercise, the airspeed rises and glide performance drops. This has resulted in a dreaded FAIL when other flaws are factored into the level of displayed performance.

The other demonstrated issue with the descent is, once again, alas, LOOKOUT! Especially dangerous when pilots make straight-in approaches, and their over-all workload is higher. They are maintaining a higher speed than the normal approach speed value, and still need to complete their required checklists, so their lookout ceases. For me, this is another, albeit small, issue that I have using printed checklists in single engined VFR ops aircraft. It's better to keep eyes and heads OUT of the cockpit than give further cause and reasons to keep them IN.

That pretty-well sums up a practical examiners view of required pilot performance. Flying isn't hard, but it requires a definite set of unique skills that differ from apparent logic and almost anything else a human can do that's not in some way, related to the air. A failure on the pilot's part to maintain these skills makes him/her a danger to themselves and all others in the air including their passengers

Note that these skills are the practical ones, the physical things that pilots need to do. Another piece will follow covering the mental skills a pilot needs to safely fly. Watch this space…….

Happy Flying.

A Sunstrike Caution

By Rob Knight

Sunstrike affects all forms of vehicle, automotive, or aviatory. Although it is most likely to occur close to sunrise or sunset when the sun's rays hit your windscreen at a low angle, it can occur at any time during the day. Its effect is to make it very difficult, or even impossible, to see ahead and is therefore a very dangerous condition to drive or fly in. To avoid the issue, follow the guidelines below.

- Be prepared for possible sunstrike when flying close to sunrise or sunset, especially when heading towards a low-angled sun.
- Maintain a clean windscreen, inside and out. Dust and grime on the windscreen will exacerbate the issue and make the effects of sunstrike even more blinding to one's eyes.
- Wear sunglasses when driving with the sun in your eyes.
- Use sun-visors to block the sun (where fitted), and/or or wear good quality sunglasses/ shades to reduce the effects where possible. Caution – some lenses such as multi-focal and/or polarising, can also have severe issues with seeing small objects at a distance OR using LCD screens and all glass cockpits.
- Be aware that clouds can cause the sunstrike effect when sunlight is reflected into the windscreen. This can be almost as bad as strike from the sun itself.
- If you experience sunstrike, it may be best to pull over and wait for a few minutes until your eyes adjust or visibility improves.

Be very aware that, if you experience sunstrike, it may take several minutes for your eyes to return to normal during which time your vision will be severely inhibited. This is a serious issue with crop dusting and operating in the very early morning. To be totally blinded at 50 feet whilst flying is definitely not habit forming. For more normal aircraft operations, it is less frequent but can still constitute a serious hazard.

To avoid sunstrike, be very aware of the relationship of the aircraft heading and the position of the sun, and try to avoid flying directly at it. For example, landing in the very late afternoon into a very bright sun at a very low angle, it might be wise to select an alternative runway direction is one is available. Lastly – keep your windscreen CLEAN!

I learned as an ag pilot to use Pledge furniture polish in an aerosol can (available from Woolies or Coles), and have applied it on my windscreens now for fifty-three years. Clean the screen first with plain cold water to remove as many scratchy bits as possible, then spray Pledge across the screen. Then clean off using vertical and horizontal movements **ONLY**, to remove the spray. WARNING - circular motion WILL cause localised heating on the lexan or Plexiglas which will, in turn, crazy-crack the surface and destroy the screen.

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Aerolite EV-103!

The Aerolite EV-1.3 is perhaps the first viable all-electric fixed-wing Ultralight Aircraft

The clean, tidy, and drag-free lines of the PMAC (Permanent Magnet Alternating Current) motor

The Aerolite EV-103 uses the very popular, proven and well-designed Aerolite airframe, with very slight factory modifications to accommodate the installation of the battery tray. The Aerolite EV-103 is available as a complete fast-build kit or completely assembled and ready to fly aircraft, just like all of our gasoline powered models. In addition, all existing current production Aerolite aircraft can be converted to electric propulsion if the owner so desires.

Available with 2, 3 or 4 lithium-ion rechargeable battery packs, the complete electric propulsion system provides an average of 20, 30 or 40 minutes of flight time respectively.

The info below will answer many of your questions, and outline the specifics of the system:

HOW LONG WILL IT FLY ON A FULL CHARGE:

The first question everyone wants to ask is “How long will it fly on a full charge?” The answer to that question is a bit convoluted, as duration is directly related to HOW you will fly the aircraft. The short answer is ‘approximately 10 minutes per battery.’ 4 batteries will give you about 40 minutes of conservative flight time, 3 batteries will give you approximately 30 minutes, etc. You must have a minimum of 2 batteries for flight.

Our flight testing so far has shown that if you do a full power take off, reduce power and climb to 700 feet or so, then set your power to have a cruise speed of 40-45 MPH, you will be able to fly a maximum of approximately 40 minutes with 4 batteries. If you want to increase your cruise speed, total flight duration diminishes accordingly. If you intend to do repetitive take offs and landings in the pattern, total available flight time will also lessen, as the consumption of battery power is disproportionately higher during take-off and climb (you do not normally need full power to climb).

As currently configured, the electric propulsion system produces a maximum of 22 kW of power (which is approximately 30 HP).

Cruising power of 10-12 kW results in a cruise speed of 40-45 MPH.

General Info on the Propulsion System:

The standard system uses a sensorless brushless PMAC (Permanent Magnet Alternating Current) motor, an advanced motor controller with temp sensing and configurable displays, and ruggedized batteries with BMS. It offers ~20kW continuous and up to 25kW peak power and 5.2kWh of energy. The entire drive system weighs about 30 lbs. Each battery weighs just under 36 lbs. If you use 2 batteries the complete system (controller, cables, and throttle) weighs 101 pounds. With 3 batteries the complete system is 137 pounds and with 4 batteries it is 173 pounds.

Motor:

The motor is designed for a maximum of 2000 RPM's. Maximum continuous power is ~15kW and maximum peak power is >25kW. Voltage is 72 Volts DC nominal.

Controller:

The controller has a continuous power rating of ~25kW and a peak power rating of ~30kW. Controller voltage is 72 Volts DC nominal. The controller has over and under voltage protections as well as motor and controller thermal limit protections. The controller can also be connected to a display or app to view EFIS type information.

Batteries:

Each battery uses a total of 240 Samsung 30Q cells. These are configured in 20 cells in series to get the 72v and then 12 series strings in parallel to achieve the desired capacity. The battery is managed by a BMS with over and under voltage and temperature limits. The battery is fully potted in a weatherproof poly-urea compound which makes it extremely tough and durable. These batteries should provide more than 500 cycles at >80% original capacity in normal flight profiles.

Battery installation is behind the seat and close top the Centre of Gravity

- Batteries: 20s x 12p
- Voltage: 20s (72VDC nominal)
- Amperage: 36Ah
- Energy: 2.6kWh
- Power: 15kW
- Weight: 36 lbs.
- Size: 5.75" x 5.75" x 13"

Charging the Batteries:

Each battery is supplied with its own 110volt charger. The way the system is wired, you can also plug one charger into any of the batteries in the aircraft, and the single charger will charge all batteries at the same time. Chargers shut themselves off automatically when the battery (or batteries) are fully charged. Other fast charging options are also available (providing charging times of less than 2 hours total).

THROTTLE:
The throttle is weatherproof and durable contactless hall-effect type. There is no Potentiometer or physical sensor to wear and fail.

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https://www.uflyit.com/Aerolite%20ev-103.htm

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Why The Crash of The Soviet Concorde Raised So Many Questions

By Henry Kelsall

During the Cold War, the Soviet Union had seen the development of the Concorde supersonic airliner and decided they wanted a slice of that cake. Thanks to some espionage and a massive political push, the Tupolev aircraft company came up with the Tu-144, NATO military reporting name Charger. Dubbed Concordski thanks to its similarities with Concorde, The Soviet airliner flew a few months before Concorde, in a massive political coup for the Soviet Union, even if it was soon obvious the design was quite rushed and had relied on espionage.

The TU-144, Concordski

However, any hopes the aircraft had of success came literally crashing down at the 1973 Paris Air Show. A Tu-144, CCP-77102, was conducting a display at the show when it broke up in a dive, crashing into the small village of Goussainville and killing all on board, the aircraft and eight people on the ground. What makes the accident, so bizarre is the mystery around the actual cause of the accident, with a couple of theories floating around as to why the Tu-144 suffered the accident. Either way, it badly hurt the hopes Tupolev had for its Concordski.

The Tu-144 was quite a crude copy of Concorde. It had four Kolesov RD-36-51 turbojet engines and actually had a higher top speed than Concord of 1,600 mph or Mach 2.15. However, the cabin of the Tu-144 was incredibly noisy, and it needed full afterburner to maintain Mach 2. Concorde had supercruise, whereby after reaching Mach 2, reheat was then turned off, and the airliner would cruise at Mach 2. As such, The Tu-144 could never really fly at Mach 2 during its brief commercial life. It also suffered many reliability problems and technical gremlins.

What's more, the crude nature of the copy meant its delta wing lacked the conical camber of Concorde's, and thus it lacked lift. As such, two canards were then added to the front of the Tu-144. Despite the issues, the Soviet Union heralded the Tu-144 as a great success and its appearance at the 1973 Paris Air Show marked the first time the aircraft was on public display in the West. Aboard the aircraft at the show was pilot Mikhail Kozlov, co-pilot Valery M. Molchanov and a further crew of four to make up the six-man team.

There was an intense rivalry between the two Concorde and Tu-144 at the show, and Kozlov was quite determined to show the world that the Tu-144 was more capable. Concorde performed a sedate display on the final day of the show, but naturally the British and French did not want to stress the aircraft with it still in the prototype stages. The Tu-144, S/N 01-2, registered CCCP-77102, then took to the air for its display, although prior to this, the Soviet crew was suddenly informed that they did not have as much time for their display as originally intended.

Near the end of the display, Kozlov made a landing approach before putting on full power and pitching the aircraft into a steep climb. At around 2,000 ft the Tu-144 pitched downward, after possibly stalling and entered a steep dive. As Kozlov tried to pull the aircraft up, the Tu-144 broke apart into several large chunks, smashing into the ground in Goussainville and bursting into flames. This had followed quite an aggressive display from the Tu-144, and from the outside it looked like the aircraft had simply been over stressed in that steep dive, and the airframe could not cope. The eight people on board were all killed, as were eight people on the ground.

It's clear that the Tu-144's airframe was simply overstressed during the accident. British Harrier test pilot John Farley said that pitching the Tu-144 violently downwards was a violent bunt, and that the engines wouldn't have handled it and that the engines would have lost thrust. That would have contributed to the Tu-144 not recovering earlier from its dive, which would have been to get the engines going again. Either way, the reasons for the violent manoeuvre and the cause of the accident have never been truly explained. There have even been rumours of the French and Soviet governments colluding to cover up the real cause. We might have theories, but the Tu-144 accident will always remain a mystery. It ruined the reputation of the Tu-144, and as such it served in Soviet commercial passenger service for less than a year.

Note:

Five years later, on Tuesday, 23rd May 1978 a second fatal accident happened with the Tu-144D. This one, S/N 06-2 registered CCCP-77111. During a test flight the rupture of a fuel line caused the leak of 8 tons of fuel inside the right wing. Two engines were shut down by fire alarm but the failure of a third engine forced an emergency landing on a field near Yegoryevsk. The plane was consumed by fire and later scrapped.

The crashed CCCP-77111

2 crewmembers on board were killed. 6 crewmembers on board were injured.

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No Errors in Aviation are Minor

By Rob Knight

As a pilot, every time that I fly, I put my future in the hands of the men who have and who continue to maintain the aircraft I have strapped to my butt. I am currently filling my ninth logbook covering the 62 years since I took my first training flight and the inked pages contain some 12000 hours plus hours of experience. Surely such a tally is a valid mark of the care, workmanship and professionalism of those unfaced engineers that have worked on all the aeroplanes that I have flown and continue to fly. Without their untiring efforts to protect my safety, perhaps I wouldn't be sitting here writing this piece for you to read.

Amongst those entered hours is just one single reference to an issue caused by the failure of a person to carry out maintenance on my aircraft correctly. However, that one was, even so, a bit of a challenge.

ZK-CHF and me, Waitemata Aero Club, 1978, a few months after the incident

It occurred in a Victa 100. ZK-CHF, was one of three Victas owned and operated by Waitemata Aero Club at Ardmore in the 1970s. Two were actual 100 models powered by Continental 0200s, ZK-CHF and ZK-CGM, while the third was a rebuild from a 100 repowered by a 130 hp Rolls Royce/Continental 0240 engine making it an AESL Airtourer T3. It was re-registered ZK-DLU. This trio provided the training fleet for all the pilot training the Club undertook, as well as general two place aeroplane hire.

It was a routine lesson, mid to late morning, on a fine day with little wind and good visibility. With me was a young lady, a bank teller, doing her first medium turns lesson. Her parents owned a property at Taukau, on the southern boundary of the Ardmore training area, so, as we climbed out, I started the lesson generally heading in the direction of the town. The medium turns lesson is simple and basic. It contains no drama potential and Margo was a better-than-average student; her father owned a trucking company and she was licensed to drive his trucks so she had a good grounding in mechanical things. Slowly we slalomed our way through the turning lesson to her parent's property and I set her up to fly a gentle left turn over their house.

The turn was fine and all seemed sweet until my attention was drawn to a tiny vibration that wasn't normally there. Insignificant at first, I noticed it because CHF was the Victa I most usually flew and I was very familiar with her quirks and fancies. But this one was new. It was different, an addition to all the other familiar ones. I wanted to know more about it.

I said nothing. There was no cause for alarm at that time, just a need to pander to my alerted interest in ascertaining the cause of the faint vibration and assessing its potential significance. Margo completed the 360° left turn and, as I had instructed, rolled gently level before banking and entering a turn to the right around the house. We were still within a couple of hundred feet of our entry height so there was no need to distract her with comment - nothing to worry about for a first turning lesson. The ball was also OK, close enough to the middle, so I was happy letting her get some practice and confidence. Refinements would come after practice.

The vibration worsened and I could see a slight shake had developed in the bobbin-mounted instrument panel; not enough to influence the needle readings but visible nonetheless. Although the RPM remained set at 2400, I reached over and pulled the carburettor heat to ON to eliminate ice as a possible cause. The normal symptoms of applied carb heat came, and went with my pushing back in of the control knob. The vibration continued unabated - carb heat on or off - whatever was causing the problem, it wasn't carburettor ice! I checked the mags. Nothing to note there.

The distance back to Ardmore was only about 14 nm and it would take us a mere 10 minutes or so. But the vibration was worrying and I decided to cut the lesson a little short. When CHF's nose was headed the way I wanted, I got Margo to roll out and set her up to practice the previous lesson – straight and level as we tracked back to Ardmore. With half my mind on instructing and the other half feeling for changes in the vibration, I talked about her feet, reminding her that these and the rudder pedals formed the control that kept us straight, and would take is back to the red-coloured hills at the back of Ardmore I had given her as a reference point. She sat there, trying to get her feet working to keep the nose in one place whilst I began to worry. The worsening vibration could now be felt through the airframe. It was no longer a minor issue. I quietly reached across and checked the mags again, slower this time, one at a time. But CHF vibrated as badly on the left and right mag as she did on both – still no joy there, either. I was running out of ideas and options.

Abeam Pukekohe, I asked if she could feel any vibration. She shook her head so I took back control to see if my added attention to those parts of the aircraft might assts in figuring out the cause of my concern. My sunglasses were beginning to tickle on my nose - the vibration was very obvious and it was only Margo's inexperience that was hiding it from her.

The visibility from the cockpit is pretty good from a Victa, and I had already furtively looked at what I could see of the wings and control surfaces out on both sides. But maybe Margo could see something from her angle on her side - I asked her to check and see if there was anything loose or vibrating. Again, it was a negative!

Now I was applying a small amount of left aileron and left rudder to maintain wings level and straight. Whatever was causing that persistent and ever-developing vibration was now affecting our lift. Either the problem was adding to the lift on the left wing, or more likely, diminishing the lift on the right, on my side. I looked again carefully. There was no sign of a problem but the right aileron could easily be seen extended slightly down, and the actual surface was visibly vibrating. So was the stick vibrating from side to side, in harmony. My unease continued to grow.

I had let CHF drift down to 1300 feet, the normal Ardmore downwind leg rejoin height, and we were approaching Drury, the standard VFR reporting point for traffic intending to join the circuit from the training area. Adjacent to Drury was a satellite airfield known locally as, "The Glider Farm". As its name suggests, it was home for the day-to-day operations of the Auckland Gliding Club and there were a sizeable number of gliders either sitting in the ridge lift on the Hunua Hills, or in the circuit at the Farm. Unless I had a serious, full-blown emergency to hand which, although concerned, I had not yet declared, this was not the best option. Five more minutes and we'd be landing at Ardmore.

Crossing Drury village, I called Ardmore for a rejoin clearance and was cleared to join downwind for runway 21. The advised traffic was light with only a couple of relevant aircraft ahead. I decided to see how CHF would behave at 70 knots IAS, the normal approach speed.

I briefed Margo and made sure that her harness was tight, as was mine. With carb heat on I eased the power back and held the nose up. The speed began to decay but quickly, at a shade under 80 knots, CHF rolled violently to the right and her nose snatched down. The windscreen filled with rotating farm paddocks.

Poor Margo, she got a helluva fright (as did I), and when I got the wings level and was out of the dive the vibration was now shaking the whole aircraft. I had to hold more than half left aileron to get the wings to stay level. I swing the nose gently around to return to my track back to Ardmore.

I called Ardmore again and advised that that I was now experiencing control difficulties in roll, and requested that I expedite my approach. The first aircraft ahead had landed and the Tower gave the second a hurry up. ATC then cleared me to land even though I had not put out a downwind call. Then I saw the fire truck (actually a Land Rover with a trailer) appear as it was driven out of its shed by the tower, and headed for the threshold of 21.

I let CHF slowly descend along the downwind, leg, and I angled the nose a little towards the runway end to shorten my base leg. I used power and maintained the 80 knots I had decided was my minimum speed the whole way in. The turn onto base, and then onto finals, was continuous, and crossing the fence, I felt elated as we were at a height now, where if I lost it, it was most likely we'd have a chance of surviving.

Over the piano keys I flared. As the descent ceased the starboard wing stalled, just as it had done at Drury, and the starboard wheel and then immediately after, the nosewheel, slammed down on to the bitumen so hard I thought I had burst the tires. I hadn't, and neither did I get a prop strike although it must have been close with the flexing of the McPherson Strut supporting the nose leg. The roll-out was otherwise normal as was the directional control once the wheels were all on the ground.

ATC had advised the Club that CHF had declared a control problem and several Club members and instructors met us on the manoeuvring area as we taxied in There were just shaking heads and blank looks all around- no-one could see any issue from outside. I was expecting someone to signal that I had sheets of metal skin falling off, or something, but there was nothing. Nothing was rattling, dragging, or scraping. All my flight controls felt normal, and appeared to move appropriately without binding or untoward noise. No-one could see anything that had come loose, or was falling off.

Back on the flight line I parked and shut down. As we vacated the aircraft the office girl took Margo and said that she'd get her a cuppa and handle the post flight paperwork so I could get a snag sheet written up. But what was I going to write up as the cause?

Then we found it. It was insidious and hidden, both in-flight and on the ground. And it took the multi-person subsequent walk around to actually find it. The gritted walkway mat on the starboard side had come loose from its leading edge and ripped itself free of the wing surface for about 60% of its length. On the ground it had fallen back into place and, lying flat, it looked absolutely normal. However, in flight the slipstream and airflow had folded it back to the extent that its front edge reached nearly halfway back to the leading edge of the tailplane. It was invisible to me because the curve of the blown canopy didn't allow me to see sufficiently close to the fuselage to see it. No wonder we could feel a vibration and suffered the wing stalling without warning at a much higher airspeed than normal. And what great luck for Margo and me that it hadn't torn free and jammed the tailplane and elevator. The consequences of that were unthinkable as were the potentials had the flight time been much longer.

Yet here it was, innocuous and latent whilst sitting on the ground with no airflow or slipstream. It appeared absolutely normal and had no appearance of any issue, the walkway lay completely flat on the metal skin. But it took little effort to raise its front and fold it back on itself. The fabric was square-ended, no fraying, and was brand new. The adhesive used appeared OK, attached firmly to both the metal skin and the underside of the lifted fabric. The question was, in flight, then, why had the adhesive failed, potentially catastrophically. To say that I was pretty unhappy about the whole thing is a gross understatement and, for once, the Club's CFI and committee were in complete agreement with me.

The question was put to the company that carried out the maintenance for the club as CHF had completed a scheduled annual inspection the previous afternoon. Mine was the first flight after the aircraft was delivered back to the Aero Club by the maintainers late the previous day.

It was explained to us (and to me) that when the old and worn walkway that had been fitted was replaced as part of the annual inspection, a new mat was cut to size and a new apprentice was tasked with gluing it in place after cleaning the old adhesive from the wing skin. Apparently, he not only failed to remove the old special adhesive attached to the skin, he simply glued the new mat to the old adhesive with standard F2 glue out of a cold can. It wasn't up to the task - it lasted a bare 20 minutes in flight.

Starboard walkway mat

A model of a Victa showing the starboard walkway mat

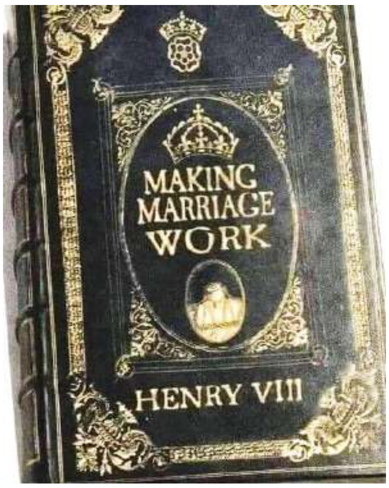
Had that flight been a Club hire, or a student on a training flight, the outcome could have been severely different. For that matter, had our flight been much longer…………..

Needless to say, since then I have never pre-flighted a Victa without carefully checking the walkway mats for security. It also made me more aware of the potential problem with other types and included the more attentive checks to the Pipers and Grummans I also flew.

Happy flying

FLY-IN Invites Looming

WHERE	EVENT	WHEN
Murgon (Angelfield) (YMRG)	Burnett Flyers Breakfast Fly-in	**Find Next Planned EVENT Sunday 11 June. Confirm details at: http://www.burnettflyers.org/?p=508**



Boeing Bird of Prey Shrouded in Secrecy Still

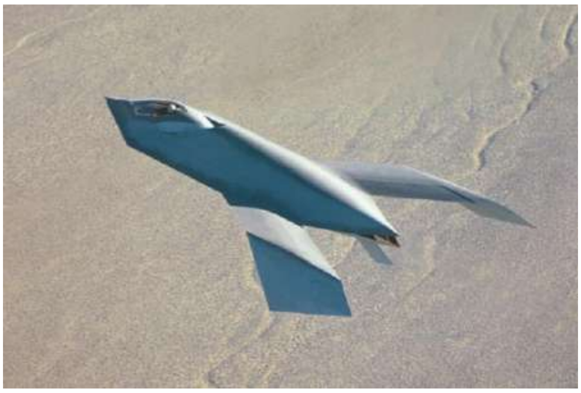
By Jason McDowell. Published March 7, 2023

Named after a Klingon spacecraft from Star Trek and given the designation “YF-118G”, the jet incorporated dramatic design inside and out.

The striking Bird of Prey on display at the National Museum of the USAF in Dayton, Ohio.
[Courtesy: Jason McDowell]

Throughout the late 1980s and early 1990s, McDonnell-Douglas was struggling to secure contracts for the production of tactical military jets. In 1986, after submitting multiple proposals for the USAF’s Advanced Tactical Fighter (ATF) program, the company was excluded from the running. Later, it partnered with Northrop Grumman to develop the YF-23, only to lose to the F-22 in 1991.

Reeling from these losses, company leaders decided they needed to make up lost ground. Recognizing that stealth technology and affordability were key elements in future success, they launched a program in 1992 to develop their capabilities. This program entailed the design, manufacture, and testing of a cutting-edge research aircraft that would become known as the Bird of Prey.



During flight testing, a small ventral fin was added to the tail. It was removed prior to the aircraft’s retirement.
[Courtesy of Boeing]

Named after a Klingon spacecraft from Star Trek and given the designation ‘YF-118G,’ the jet incorporated dramatic design inside and out, albeit in very different manners. The fuselage, wing, and exterior were designed to explore multiple facets of stealth technology above and beyond, minimizing the radar cross section (RCS). While the RCS is estimated to be as small as a mosquito, engineers also buried the engine deep within the fuselage to minimize the infrared signature and even carefully designed the paint shading to visually mask the actual fuselage shapes in daylight—a measure not utilized by other stealth aircraft such as the F-117 and B-2.

Less visible but no less significant were the efforts made toward the company's goals of streamlining the design and assembly processes and ultimately improving affordability. By utilizing rapid prototyping techniques through the use of computer programs and 3D rendering, engineers were able to simulate the performance of individual parts and systems aboard the aircraft, thus minimizing the need to continuously produce and test multiple iterations of physical parts. These efforts even extended to making tooling easier and more affordable to manufacture.

A parallel effort was made to reduce the cost of the aircraft itself through the use of off-the-shelf components wherever possible. By selecting an off-the-shelf business jet engine, landing gear from Beechcraft turboprops, an ejection seat from a Harrier, and cockpit controls from various existing tactical jets, the team scavenged scrap yards and kept the balance sheet under control. Ultimately, the entire program reportedly cost $67 million, less than the cost of two new 737s at that time.

Despite the unusual, non-traditional airframe configuration, the Bird of Prey eschewed fly-by-wire technology in favour of less-expensive hydraulic flight controls. [Credit: USAF Photo]

When the Bird of Prey made its maiden flight in September of 1996, it quickly became clear that the aircraft, with its highly-swept, 23-foot-span wing, did not exhibit good flying performance. Fortunately, it didn't need to. With an airframe that placed far greater value on low observability than on aerodynamic performance, the speeds, altitudes, and handling characteristics were less than impressive.

While the ejection seat is visible to museum visitors, the cockpit and instrument panel are not. [Courtesy: Jason McDowell]

Despite being put on display, one curiosity remains—an apparent lack of any publicly-available photos of the cockpit or instrument panel. While it's unlikely these are still officially classified, the jet currently hangs at a height that keeps them well out of view. Additionally, the cockpit windows of the similarly spooky Tacit Blue stealth testbed were painted black for display in the museum, also preventing any views into the cockpit.

Whether these efforts are coincidental or intentional, they certainly lend an air of mystery to aircraft that themselves were shrouded in secrecy from the beginning.

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The Fokker D.VII - Germany's Best in WW1

By Rob Knight

The **Fokker D.VII** was arguably Germany's best fighter aircraft produced during World War One.

A Fokker D.VII

Designed by Reinhold Platz, Fokker Aircraft's chief designer, Germany produced about 3,300 of these aircraft in the second half of 1918. In service with the Luftstreitkräfte, the D.VII quickly proved itself to be a formidable aircraft. Held in such high regard by the Allies, the Armistice ending the war required that Germany was to surrender all D.VIIs to the Allies. Surviving aircraft thus acquired saw much service with many countries in the years after World War I.

Starting in 1916, he had been working on a series of experimental V-series aircraft that were notable for the use of cantilever wings. Hugo Junkers had originated the idea in 1915 with the first practical all-metal aircraft, the Junkers J 1 monoplane, nicknamed *Blechesel* (Sheet Metal Donkey or Tin Donkey). Such wings were thick with a rounded leading edge, this configuration giving greater lift, and its relatively "blunt" leading edge giving it more docile stalling characteristics than the other, thin aerofoil designs commonly in use at the time.

The D.VII's wooden propeller and note the contour of the upper wing leading edge

Late in 1917, Fokker built the experimental V 11 biplane, which he powered with a 170hp Mercedes D.IIIa engine. In January 1918, the Inspectorate of Flying Troops held a fighter competition at Adlershof, where, for the first time, front line pilots were invited to participate in the evaluation and selection of new fighters. Fokker submitted the V 11 along with several other prototypes. Manfred von Richthofen flew the V 11 and reportedly found it tricky and unpleasant and, worse for a fighting pilot, directionally unstable in a dive. To counter this, the rear fuselage was extended by one structural bay and a triangular fin was added in front of the leading edge of the rudder. Richthofen tested the modified V 11 and revised his report, praising it as the best aircraft of the competition. It offered excellent performance from the outdated Mercedes engine, yet was safe and easy to fly. Richthofen's recommendation virtually decided the competition, but he was not alone in recommending it. Fokker immediately received a provisional order for 400 production aircraft, which were named D.VII by *Idflieg,* the Inspectorate of Flying Troops.

Alas, the Fokker's factory was inadequate for the task of meeting such an order and *Idflieg* directed the Albatros aircraft factory to build the D.VII under license but there was a hitch - the Fokker factory did not use detailed plans as part of its production process, Fokker simply sent a D.VII airframe for Albatros to copy. The inevitable result was that some parts were not interchangeable between aircraft produced at different factories.

While the earliest production D.VIIs were fitted with 170–180 hp Mercedes D.IIIa engines, production quickly switched to the intended standard engine, the higher-compression 200 hp Mercedes D.IIIaü. Some early production D.VIIs delivered with the Mercedes D.IIIa were later re-engined with the D.IIIaü.

By mid-1918, some D.VIIs received the "over-compressed" 138 kW (185 hp) BMW IIIa. The BMW IIIa followed the SOHC, straight-six cylinder configuration of the Mercedes D.III but included several improvements such as Increased displacement, a higher compression ratio, and an altitude-adjusting carburettor. These combined to produce a substantial increase in speed and climb rate at high altitude. Because the BMW IIIa was over-compressed, using full throttle at altitudes below 2,000 m (6,600 ft) was restricted as it risked inducing detonation in the cylinders and damage to the engine. At low altitudes, full throttle could produce up to 240 hp for a short time. Fokker-built aircraft with the new BMW engine were called D.VII(F), the suffix "F" standing for Max Friz, the engine designer.

D.VIIs flew with different propeller designs from different manufacturers. Despite the variations there is no indication these propellers gave disparate performance. Axial, Wolff, Wotan, and Heine propellers have been noted.

With the aircraft performance being so superior, top German aces were keen to use the aircraft in combat. At least two such “aces” are closely associated with the Fokker D.VII.

Hermann Göring, Commander of Jagdgeschwader 1, standing beside his Fokker D.VII 5125/18. He holds a walking stick previously owned by Manfred von Richthofen.	
Ernst Udet. Standing beside his D.VII, nicknamed "Lo".	

The Fokker D.VII appeared on the Western Front in April 1918 where Allied pilots initially underestimated the new fighter’s performance because of its squarish and ungainly appearance. But they quickly revised their view in light of the type’s quickly obvious advantages over the older Albatros and Pfalz scouts. Unlike the Albatros scouts, the D.VII could dive without any fear of structural failure. The D.VII was also noted for its excellent manoeuvrability and climb rate, its remarkably docile stall and reluctance to spin. It was able to "hang on its prop" without stalling for brief periods of time, and spray enemy aircraft from below with machine gun fire. These handling characteristics contrasted with allied scouts such as the Camel and SPAD, which stalled suddenly and sharply and spun vigorously.

But the design had its own problems within. Several aircraft suffered rib failures and fabric shedding on the upper wing. In others, heat from the engine sometimes ignited phosphorus ammunition until additional cooling louvers were installed on the metal sides of the engine cowling panels. In yet other aircraft, fuel tanks sometimes broke at the seams in flight and pilots and aircraft were incinerated. In addition, aircraft manufactured at different plants suffered idiosyncrasies in that examples built by the Fokker factory at Schwerin suffered lower standard of workmanship and materials. However, despite its faults, the D.VII proved to be a remarkably successful design, leading to the familiar aphorism that it could turn a mediocre pilot into a good one and a good pilot into an ace.

A moder replica of the D.VII produced by the Vintage Aviator.com in New Zealand, constructors of replica military aircraft

Richthofen never saw combat in the D.VII, he was killed just days before the D.VII began to reach the Jagdstaffeln. Other pilots, including Erich Löwenhardt and Hermann Göring, quickly made additional successes and generally lauded the design. Aircraft availability was limited at first, but by July 1918 there were 407 in service. Larger numbers became available by August, by which point D.VIIs had achieved 565 victories. The D.VII eventually equipped 46 Jagdstaffeln. When the war ended in November, 775 D.VII aircraft were in service.

SPECIFICATIONS (D.VII WITH MERCEDES D.III ENGINE)

General

- Crew: 1
- Length: 6.954 m (22 ft 10 in)
- Wingspan: 8.9 m (29 ft 2 in)
- Height: 2.75 m (9 ft 0 in)
- Wing area: 20.5 m^2 (221 sq ft)
- Empty weight: 670 kg (1,477 lb)
- Gross weight: 906 kg (1,997 lb)
- Powerplant: 1 × Mercedes D.III 6-cyl. water-cooled in-line piston engine, 120 kW (160 hp) or 1 × 130.5 kW (175 hp) Mercedes D.IIIa 6-cyl. water-cooled in-line piston engine or 1 × 137.95 kW (185 hp) BMW IIIa 6-cyl. water-cooled in-line piston engine (180 kW (240 hp) rating at low level, emergency only, risk of engine damage.)
- Propellers: 2-bladed fixed-pitch propeller

Performance

- Maximum speed: 189 km/h (117 mph, 102 kn) with BMW IIIa engine – 200 km/h (124 mph; 108 kn)
- Range: 266 km (165 mi, 144 nmi)
- Service ceiling: 6,000 m (20,000 ft) [17]
- Rate of climb: 3.92 m/s (772 ft/min) ::::with BMW IIIa engine – 9.52 metres per second (1,874 ft/min)
- Time to altitude: [18]
  1,000 m (3,281 ft) in 4 minutes 15 seconds (1 minutes 40 seconds w/ BMW IIIa)
  2,000 m (6,562 ft) in 8 minutes 18 seconds (4 minutes 5 seconds w/ BMW IIIa)
  3,000 m (9,843 ft) in 13 minutes 49 seconds (7 minutes 0 seconds w/ BMW IIIa)
  4,000 m (13,123 ft) in 22 minutes 48 seconds (10 minutes 15 seconds w/ BMW IIIa)
  5,000 m (16,404 ft) in 38 minutes 5 seconds (14 minutes 0 seconds w/ BMW IIIa)
  6,000 m (19,685 ft) (18 minutes 45 seconds w/ BMW IIIa)
- Wing loading: 43.0 kg/m2 (8.8 lb/sq ft)

Armament

- Guns: 2 × 7.92 mm (0.312 in) LMG 08/15 "Spandau"machine guns

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

1. In a gliding turn and maintaining a constant angle of bank, an aeroplane's natural tendency to over-bank is decreased. Why?
   A. Because of the increased loading in a steady turn.
   B. Because the angle of attack on the inner wing is increased in the turn.
   C. Because the angle of attack on the outer wing is increased.
   D. Because the airspeed affecting the inner wing is increased in a turn.

2. Why are tailwheel type aeroplanes more prone to weathercocking problems that nose wheeled aeroplane whilst taxiing in a crosswind?
   A. The low tail position will adversely affect the lateral stability and this cause problems in crosswinds.
   B. The Low tail position creates issues with pilot visibility making accurate ground control more difficult.
   C. Adverse effects caused by the change in the Thrust/Drag couple with the nose high attitude of a taildragger disrupt normal airflows around the tail fin reducing its authority.
   D. The centre of gravity on tailwheel aircraft must lie ahead of the main wheels. Therefore, because there is a greater keel surface aft of the centre of gravity than on nosewheeled aircraft, crosswind gusts will have a greater effect on the directional stability.

3. Some pilots are convinced that an aeroplane's lack of airspeed causes a stall. How, then, can an aeroplane suffer from a highspeed stall?
   A. The wing angle of attack exceeds the stalling angle at higher-than-normal airspeed.
   B. Ther is no such thing as a high-speed stall.
   C. If the ball is not centred.
   D. A and C are both correct.

4. A pilot "forgets" to change fuel tanks in flight which results in the right fuel tank having 40 litres, and the left a mere 5 litres, when he realises and changes tanks. What extra caution should he consider when making his approach to land?
   A. NOTE: a higher stall speed on the left wing than the right wing.
   B. NOTE: a higher stall speed on the right wing than the left wing.
   C. NOTE: additional left rudder will be needed as the airspeed reduces in landing float to counter the added aileron drag.
   D. NOTE: additional right rudder will be required as the airspeed reduces in the landing float to counter the added aileron drag.

5. When established in a climb the balance ball tends to sit out to the right, requiring right rudder to correct. Why does the climb affect the aircraft balance ball.
   A. Because of slipstream effect.
   B. Because of adverse aileron yaw when the pilot counters propeller torque in the climb.
   C. Because the "cruise" off-set in the rudder is inadequate at that stage of flight.
   D. Because of imperfections in the airframe.

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. B is correct.
It stands to reason that, when an aeroplane is descending, both wings will descend the same distance as the aeroplane turns. However, because the wings travel arcs of differing distances, the angles of attack on each wing will also differ. The inner wing will descend the same distance as the outer wing, BUT it does so over a shorter distance. This results in an increased angle of attack on the inner wing which tends to off-set the increase airspeed of the outer wing caused by its greater speed, so the tendency to over-bank is reduced.

2. D is correct.
Tailwheeled aeroplane designs have the centre of gravity further forward than nose-wheeled types so the keel surface that forms the arm aft of the said C of G is greater. With the greater keel surface is simple a larger area for the wind to exert a force against so the tendency to weathercock will be increased.

3. A is correct.
FACT – An aerofoil (read that as aeroplane wing) stalls when its angle of attack exceeds the critical angle (aka stalling angle of attack).
If the aeroplane is suddenly pitched nose-up, the attitude can change before the flight path changes and the wing can easily exceed the critical angle of attack and a high-speed stall result. Common causes of a high-speed stall are pulling out of a steep dive too quickly at low level, and snatching the stick back in a steep turn.
See: https://www.skybrary.aero/articles/stall

4. B is correct.
The right wing, holding the greater quantity of fuel, therefore has a greater weight than the left wing. To fly wings level, a small amount of left aileron (right aileron down) will be required to provide the additional lift to support that extra fuel weight. Therefore, should the aircraft enter a high angle of attack situation when on approach, the right wing will be closer to the critical angle and will thus stall, first leading to a potential unanticipated wing drop stall.

5. A is correct.
At all times the propeller is turning, the resulting slipstream is impacting more on one side of the aeroplane's aft keel surface than the other and so creates an "out of balance" situation. Propellers turning clockwise from the cockpit (most aeroplanes) create a force pressing the tail right and so the nose yaws left. This will, in turn, create the requirement for a pilot to hold a touch of right rudder in the climb to remain in balanced flight. Note that aeroplanes with counter-clockwise turning propellers suffer the rudder out to the left.
See https://aviation.stackexchange.com/questions/58605/why-does-the-turn-coordinator-ball-move-to-the-right-during-a-climb

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

Aircraft Books, Parts, and Tools etc.

Contact Rob-on mobile – 0400 89 3632

Books (Aviation)

NEW Item	Condition		Price
Flight Briefing for Pilot ***By Birch & Bramson***	**Excellent**		**$25.00**
Mechanics of Flight ***By A. C. Kermode***	**Little used**		**$25.00**

Books (Aviation) (Selling on behalf)

NEW Item	Condition		Price
RA-Aus Pilot Certificate **Ground Training Manual (102)** ***By Dyson-Holland***	**Brand new**		**$49.00**
RA-Aus Pilot Certificate **Ground Training Manual (103)** ***By Dyson-Holland***	**Brand new**		**$49.00**

Tow Bars

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

Handheld Radios (Selling on behalf)

Item		Price
ICOM VHF Transceiver, Model: IC-A22E With • Battery, • Cigarette lighter power source, and • 240V battery charger.		**Open to Offers**
ICOM VHF Transceiver, Model: IC-A6. With 240V charger but no dock to recharge battery *(available on EBay)*		**Open to Offers**

Cockpit Electronics (Selling on behalf)

Item		Price
TRANSPAK GPS Personal Navigator Complete with • Carry bag, cigarette lighter power pack, • AA battery power pack, and • User manual.		**Open to Offers**
MAGELLAN GPS Model 315/320 With • Cigarette lighter socket power pack, and • User manual.		**Open to Offers**

Other Electronic Units (Selling on behalf)

Item		Price
PALM, model Z22, complete with • CD software, • 240V charging unit • Linking cables etc., • Still in original box.		**Open to Offers**

Other Electronic Units (Selling on behalf)

Flight Cell 2GO. Mobile phone to Headset interface • With user guide, and • Includes cable etc. See: www.flightcell.com for details		**Open to Offers**
NAVMAN. Model MY 50T automotive GOPS system With • CD, and • Cigarette Lighter socket power supply.		**Open to Offers**

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

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- 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,
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Or Mob: 0419 758 125

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$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 & furl 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 784 019

AIRCRAFT for Sale - LIGHTWING GA-55.

Registered 25-0374

Engine ROTAX 912, 80HP, 853.3 Hours

Reluctant sale of this great aircraft, I have owned her from June 2004.

Excellent fabric, Red and Yellow, always hangered, and comes with the following extras:

* 2 Radios	* Fuel Pressure Gauge
* Lowrange GPS	* Extra Tachometer
* EPIRB	* New Headsets
* Aircraft Dust Covers.	* Paint
* Manuals – various	* Oil

Work performed at Lightwing Ballina:

* Wings recovered, tanks resealed, new brakes, wheel bearings and hubs, new wing tips.

Other work carried out:

* Windscreen replaced, door panel replaced, choke cables replaced, ignition upgrade.

Rotax:

* Engine modifications, gearbox rebuild.

Currently hangared at Boonah in Queensland.

Contact Kevin McDonald on 0419 607 637

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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