BRISBANE VALLEY FLYER

September 2025

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

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An RAAF de Havilland Vampire. See page 9.

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Our website - **bvsac.com.au**

Hello All,

The month of August has been a bit slow.

During the month we were able to get all the insulation installed in new room thanks to the help from our members, well done to all. It is now ready for plaster to be installed.

Our next meeting will on the 6 September starting at 10:30am so come along and join in.

Best wishes
Ian Ratcliffe
Treasurer BVSAC

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

WANTED

New Flyer Editor

After now producing 139 issues of the BVSAC Flyer, over nearly 13 years, I am hanging up my keyboard and dictionaries, and move on to other things.

Having just found in the past few days that I now have further health issues pending, I am accelerating my departure from the position of editor of the BVSAC Flyer.

This Flyer issue will now, at best, be my second to last, regardless of whether a replacement for me has been found or otherwise. The health issues raised over the last few days dictates that my determined attention be directed to dealing with these new and ongoing changes to my life.

If you want to try your hand as the new scribe for the Flyer, please contact me, Rob Knight, or the BVSAC committee. Contact details for both are printed on/in every issue of the Flyer.

Rob Knight

My Favourite Aeroplane.

By Rob Knight

I had my first ever flight strapped beside my brother in the back seat of a 90 hp Piper PA18 Cub. It was 1959 and my father, a then student pilot with the Kaitaia branch of the Northland Districts Aero Club from Onerahi, at Whangarei, New Zealand.

ZK-BQY. After my first ever flight in 1959, at Kaitaia (NZKT).
That's me, second from the left under the trailing edge. The Cub was the BEST!

One Friday afternoon per month, an NDAC instructor flew the Cub, ZK-BQY, 75 nm from Onerahi to NZKT and spent Saturday and as much of Sunday as possible, providing dual to the members at Kaitaia, and hire to those qualified. From time to time another pilot would ferry the Club's other aircraft, a PA22 Tri-Pacer, ZK-BSE, would accompany him and we'd have the two aircraft for the weekend.

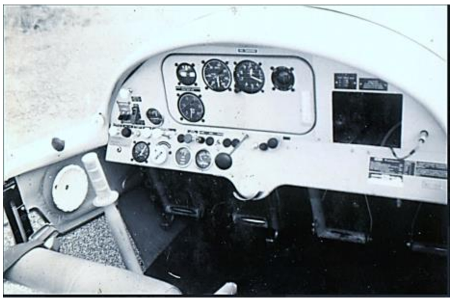
My father was one of these local students, and after flying one Saturday, he arranged for the local topdressing pilot, Johnny Nash, a friend of ours, to take my two sisters and then my brother and me, for a circuit.

The five minutes airborne were more than anything I had dreamed of, and immediately came my love for the "ol' Cub".

In 1963, my love affair for the Cub was challenged when, as a boarder at the Whangarei Boy's High boarding school, I arranged a weekend job and could pay for my own lessons. Only now the Cub had been replaced as the Club's trainer by a PA22-108 Colt, ZK-CEJ. Now I had actually had my hands around a yoke which, to my 14-year-old mind, was vastly more sophisticated than a mere bent-pipe joy stick. My allegiance swapped to the Colt, the Cub was history, for now at least. Sticks were out of fashion and yokes were in; the Colt became my aeroplane of choice.

Me with ZK-CEJ, at Kaikohe, a brand-new PPL in my pocket. September 1967.

After finishing school in 1965, I completed my PPL in that Colt and converted to the Club's newer acquisition, a red, white and beige Victa Airtourer 100, ZK-CHC, known colloquially as "Cadbury's Hot Chocolate". While I liked the centre stick in the Victa, the Colt outperformed it in every aspect and I continued hiring the Colt as my logged hours reflected the



MS880B Rallye, ZK-CBT's cockpit (VHF radio missing). The big white wheel on the left is the elevator trim.

CBT on the apron at the Northland Districts Aero Cub in 1963. The starboard automatic leading-edge slat can be clearly seen.

flights I made. The Colt remained my favourite with the Victa a close second while the Cub retreated into the gloomy mists of time. Along the way, the NDAC added two Morane Saulnier (now Socata) MS880B Rallyes. ZK-CBT was unique in any local pilot's experience in those days. While it had a 100hp Continental 0200 engine – the same power as the Victa and nominally 8 hp less than the Colt, it had 4 (four) seats, albeit with a 242lb (110kg) placarded weight limit on the rear seat. It also had the largest fowler flaps I had ever seen and automated leading-edge slats which were entirely new to me and everyone else. Except for cruise speed, this French-produced light aircraft was exceptional. The Rallye had the shortest take-off roll of any aircraft I had ever seen, regularly out performing even the local topdressers (crop dusters) in their Fletchers. And CBT was flown by Club PPLs not commercial pilots with thousands of hours in their aircraft. Landings were spectacular. Hanging those dirty big fowlers, about 20% of the total wing area, down and out the back of the wings gave a power off descent angle that looked like about 70 degrees: you came down FAST. Also, the leading-edge slats popped out, triggered by the angle of attack exceeding about 5°, and, at the bottom of the descent, the aircraft would flare instantly, and settle on the ground to only roll a very short distance without braking. Very quickly CBT became my favourite aeroplane and I suffered only from its 84-knot cruise speed, two up, with 2400 RPM on the tacho, or about 78 knots with the back seat filled, at the same power. Remember, it only had 100 hp. This aircraft was light on the controls, responsive, and with a vast flight envelope. However, it was vital the aircraft was flown in complete compliance with its flight manual limitations. Later, Lloyd Seabrooke, the demo pilot demonstrating the aircraft type to a group at Matamata, entered a stall in the first MS885 that entered New Zealand. He had over-loaded the rear seat to demonstrate its loading capacity and the aircraft entered a spin from which recovery was impossible. When the dust settled, and the newspapers reporting four dead in a new aircraft type, for the local market the aircraft type was doomed. It would never beome a major player in the local light aircraft arena.

My CPL training in 1969 was exclusively carried out in the Victa 100s on the New Zealand College of Aviation's flight line at the Auckland Aero Club. In learning the nuances of the Victa (now the Airtourer), and flying it to CPL skill level, I gained a deep appreciation of Polish-Australian, Henry Millicer's superb ideas of how a good pilot-training aircraft should fly. Light, and extremely lively, although more than a little underpowered with only a 100 hp RR Continental under the cowls, the Victa moved to first place in my choice of aeroplane. Although many disparage the Victa 100 because of its lack of power, this is more a reflection on the maturity of the disparager than anything else. It was a superb trainer because, not having a great surplus of horses under the cowls, trainee pilots became far more aware of their aircraft limitations, and in the most forceful and dramatic manner possible. There was nothing left to pull a silly pilot out of trouble. Of all the aircraft in which I instructed, the Victa 100 taught its students a greater appreciation of the

CHC at Ardmore, 1967


Me, operating off the Waiotehue airstrip in Northland, New Zealand. Note the port augmenter tube in front of the leading edge.

evils of high pressure and density altitudes than any other aircraft if the time or human instructor could.

After my CPL was competed in July 1969, and James Aviation offered me a job, the Fletcher FU-24 became my office. These, in 1970-71 were all the 300 hp versions, with great augmenter tubes protruding downwards and rearwards from the engine bay, like giant walrus tusks. These tubes passed through the cockpit and got hot enough to melt the soles of your boots if you were stupid enough to have your feet on one in flight. Naturally, with no cockpit air conditioning, they made the office a real sweat-box on operations. Also, as we used the tubes as steps to climb up or get down from the wing when exiting the aircraft, most tubes were heavily scared with melted boot soles as adornments from exiting the aircraft with a hot engine.

Its wing span was 42 feet (12.81 m), so the Fletcher, compared to what else I had flown, was BIG with a capital F. Sitting high and ahead of the leading edges of their cranked low-wings, the span seemed to sweep out and upwards towards infinity. The cockpit was also expansive, fully wide enough for two side-by-side seats, as later models were equipped, yet the semi-adjustable seat was mounted centrally. The controls were set out conventionally, stick in the right hand whilst the left operated the throttle, prop pitch, and mixture levers mounted in a frame quadrant on the side-wall. There was no floor, the seat was mounted in a frame, and if you were careless enough to drop something, you had to release your four-point harness, get out of your seat, and climb down into that open frame to retrieve your lost article.

Ever the utility aircraft, the FU-24 was tough. It was also not so pleasant to fly. That model, along with its earlier 260 hp counterparts, was fitted with bulky Cherokee style full-chord wing tips, and these allowed for no aerodynamic balancing of the ailerons. Meeting the full force of applying ailerons was the task of the pilot’s wrists, forearms and shoulders. This destroyed all control harmony as the 300 hp Fletcher’s ailerons were the heaviest in any aircraft I have flown. In fact, when spraying, I used two hands on the stick to meet roll rate needs to dodge trees and other obstacles at low level. In comparison, the rudder was light and powerful, and the elevator, an all-flying system with a servo tab, could be operated with an index finger and thumb pressure.

Power wise, the Fletcher was two different aeroplanes in one –depending on whether the hopper was loaded or empty. On take-off (I admit that I was often overloaded) it staggered into the air, sometimes being deliberately dropped off the end of the strip to allow speed to rise in a descent where terrain allowed. Then I could stagger away watching intently the oil and cylinder head temps, along with the ASI as I gathered the speed needed to begin to fly level or climb. Then, once the load had been delivered and I was on the way back empty, I was the master of a most powerful and exciting machine: one that could be hung on its prop like a cloth on a line. The airspeed off the clock, maintaining height on engine power alone, it wouldn’t stall in any conventional manner if enough power was applied. It just stagged along with it nose almost vertical, the engine torque slowly turning the aeroplane as the ailerons were outside the slipstream area. It was quite an uncanny sensation.

The hopper fitted to my Fletcher was deliberately made large enough to hold 12 CWT (one CWT (hundredweight) = 112 lbs, so 12 CWT = 1344 lb or 610 kg) of granulated superphosphate, which gave me the legal MTOW plus its legal agricultural overload according to what the flight manual that came with the aircraft provided. However, I made many take-offs with my hopper filled with powdered lime (powdered = very much denser) giving me a hopper load of around 1000 kg or a metric tonne. This was generally only safe early in the morning as the Fletcher, like the Cherokee series from the same designer, lost power and performance quickly as ambient air temperatures rose and, at these high weights, surplus power was marginal.

Although the Fletcher was exciting to fly, it was more the adrenalin rush from the low-level operations that provided the excitement and not the handling characteristics of the machine. The Fu-24 was and remains a superb utility aircraft but, nice to fly, the FU-24 300 was certainly not.

After my mentor (with in excess of 17000 hours logged just in Fletchers) was killed in an ag accident, I found myself being one of his pall-bearers and his demise prompted much thinking. Engaged to be married, I had to decide if I wanted a wife or a widow. If my mentor, with all his experience was killed, what chance did I have? With very mixed feelings, I resigned from the Company.

In 1973 I obtained my "C" category instructor rating, the bottom rung of the instructing ladder. I completed the training with Lew Day at the Waitemata Aero Club at Ardmore, and the club quickly offered me a position as a part-time instructor to work through my supervisory period under Lew's direction and on-going tutelage. This was unpaid, but I was then earning a living as a crane driver at New Zealand Steel, at Glenbrook, in South Auckland. It was a shift job so I was able to quickly start filling my logbook with instructing time in the Club's aircraft. This only lasted a short time as one of the full-time line instructors departed the Club to join Air New Zealand and I acquired his now vacant position on the full-time line.

Waitemata Aero Club's fleet at that time comprised a 90hp Cub, a PA28-140 Cherokee and two Victas. Over the subsequent 9 years, my tenure at the Club, the Cub was replaced with a 150hp version, and they added a second 140, a Cherokee 180, a 260 hp Cherokee 6, a Cessna 172, three Piper PA28-161 Warriors, and a Cessna 152 Aerobat converted to tailwheel. Then, 4 years before we parted company, the Waitemata Aero Club purchased the first Piper PA38-112 Tomahawks to come to the southern hemisphere. Also associated with the club over the years were several Cessna 150s, two Cessna 177 Cardinals, a 177A and a 177B, a Cessna 180, a Maule M4 Rocket, a Beechcraft C23 Musketeer, several Grumman AA5 Travellers, a Beechcraft A36 Bonanza, two Mooney M20Cs, a Piper PA-24-260B Comanche, and a hired CT4 Airtrainer. For a time, Grumman provided us with an AA1 Trainer hoping we'd purchase them instead of the Tomahawks. There were also several home-built aircraft owned by club members. These included a Druine D31 Turbulent, a Jodel D9 single seater and a Jodel D11 two-seater. Also, the best of the home-builts, there was a Gardan GY-20 Minicab, a delightful French design. All of these types I flew, and provided training in or for.

With all these aircraft to hand, it was very easy to compare and categorize them into my likes and dislikes. Over the years they formed firm opinions in my mind, and I ended up liking or disliking them an accordance with the roles they played in my life.

Without doubt, my least liked was the Cessna 177A Cardinal. It was simply too underpowered, and its semi-laminar aerofoil did not assist in this deficiency. On cross-country flights, it was hard to achieve even a cruise of 100 knots at 2400 RPM, the advised cruise power, and impossible if there was even light turbulence. It was sloppy and uninspiring to fly, and members seldom enthused over it. Its only attribute was that it was so disliked that it was very available if a four-seater was needed in a hurry.

The Bonanza was the most admired. It was the most expensive at (in 1981) $60.00 per hour. Mind you, a good working wage was $60.00/week back then. As the Club's CFI-ship had passed to Paul

Collard-Scruby, who lent more towards the office-management of the flying operations, as his deputy it fell to me to carry out most of the advanced-dual conversion training and checking of pilots in the more sophisticated aircraft. I became very familiar with all of them, jumping from the Moonies into the Bonanza, then across to the Cub for some strip flying. The Cherokee 6 I enjoyed, it having some of the characteristics of the Fletcher I used to fly. The 6 was used most weekends for parachute dropping (mostly with people attached) so I didn't do a lot of dual on it, more type ratings and endorsements for pilots to fly aircraft from other hirers.

From a personal perspective, my most favoured aircraft then was the Pacific Aerospace CT4 Airtrainer. Registered ZK-DGY, it was owned by Pacific Aerospace and used by them to convert pilots from countries purchasing CT4 military trainers from the company. As this was a less than frequent occurrence, it was available for hire to suitable organisations from time to time, and Waitemata made much use of it as an aerobatic trainer. As Paul was not a keen aerobatic pilot/instructor, it was passed to me to fill the role and I was the only Waitemata instructor authorised to fly the aircraft as pilot-in-command whilst it was hired to us. Obviously, a 40-minute aerobatic training flight, just after dawn, on a cloudless and clear morning, was an experience that was very hard to beat. It was the only aircraft I have ever flown in which I could complete six vertical aileron rolls before running out of steam and converting to a hammerhead at the top as I ran out of airspeed.

I became very enthusiastic with the Tomahawks. They were Tomahawk 1s, and probably the most honest trainers I ever flew in with students. If I told a student the aircraft would give a control reversal if they applied opposite aileron in a wing-drop stall, that's exactly what the aircraft would demonstrate, not now and again, but time after time. Its sheer predictability was delicious to a career instructor.

In summary, the Victa 100 was the best trainer of pilots I have experienced, its light and powerful controls taught its students feel that no other trainer did. And its lack of power was actually an asset in the training roll. However, although aerobatic, it was limited in it spin training capability as it inevitably "fell" out of a spin before a complete rotation had occurred, and the instructor merely taught the student to recover from a steep spiral dive.

In the "best trainer stakes", the Tomahawk ran a close second. Designed to have the feel of a large aircraft, the PA38-112 was heavier on the controls and notably less responsive than the Victa. As stated above, its delight was in its absolute honesty in doing what instructors told their students it would do should they use the controls inappropriately. Some students became afraid of the type because even applying a small amount of aileron at or close to the stall would see a pronounced wing drop in the opposite direction to the applied aileron. But the aircraft's sheer predictability made it eminently safe, and such students were, perhaps, not destined to make flying enjoyable for themselves.

Both stall and spin recovery characteristics in the PA38 were excellent. Those students that trained in these aircraft and went on to do aerobatic endorsements had a distinct advantage in the way the PA38 had trained them in stall and spin control in entry and recovery.

After Waitemata Aero Club, I owned several aircraft. These were Cessna 150s on flight lines and I did a couple of thousand hours instructing in them. As trainers, they gave me nothing to complain about. My students passed the flight tests and none were bent so far out of shape by students not to be repairable. As a training type, I found them a little too forgiving to be ideal and, although the qualifying students were absolutely adequate in terms of their personal proficiency in meeting the flight test requirements, I felt that they didn't have the polish that either the Victa or the Tomahawk would have left them with had they trained on them instead of the Cessnas. The Cessna 152 I would also put into that same category, perfectly adequate trainers, producing pilots adequate to meeting standards, but not quite as refined as the previously mentioned pair.

I also owned a Grumman AA5 Tiger, the nicest of the non-retractable, fixed pitch club-type aircraft. It was too expensive to service and operate economically as a general hire aircraft.

I flew three agricultural aircraft other than the Flecher. I did a few hours in a Transavia Airtruk, and did some production testing for Pacific Aerospace in a DHC-2 Beaver. Both were interesting to fly, the Airtruk probably the nicest, but the control harmony in the Beaver, equal to the DHC-1 Chipmunk, was the best I ever experienced. I also got to briefly fly Cessna C188 Ag wagons. About 20 hours assisting a friend who used them in his business, and then ferrying one needing an engine change to Ardmore. The C188 was more powerful than the 180 but similar to handle. Nice to fly but not extraordinarily so.

As cost-effective, club-type hire aircraft, there was little between the Cessna 172 and the PA28s on the Club line. Statistics dictate that more PA28s are involved in weather related accidents than the 172 series, but therein lies the prime advantage of the PA28 flight characteristics to a hiring operation. The PA28 aerofoil gave a softer ride to the aircraft's pilot and passengers in turbulence, the common forerunner of inclement weather. This meant that, in the Cessnas, in which turbulence effects are more pronounced, flight became scary at an earlier stage so they turned back earlier. In the Pipers, with the gentle ride the wings provided, allowed the pilot to continue a flight into worsening weather without alarm or passenger protest as the weather deteriorated. This was and still is a training issue, not a deficiency in the aircraft.

In July 2000 I had a car accident on my way to work, Black ice is a bastard, it totalled my car and left me a type 2 diabetic. After my designated practitioner reported it, New Zealand CAA sent a courier to my home and collected my CPL license and my Certificate of Approval to carry out flight tests for the NZCAA. I was grounded.

I didn't fly again until, visiting a fly-in at Watts Bridge in 2008, when I was first advised about RA-Aus. Before the Saturday was out, I had left a message seeking information on their phone and made a booking with John Walmsley at Coominya to begin my revisional and conversion training to RA Aus aircraft. Alas, John had too much work on to move at my pace so I went AWOL and finished my RA-Aus certificate at Boonah, with AirsportQLD.

Here I flew the Tecnam twins, the P92 Echo, and the P96 Golf that they used for training. Both were adequate, but I couldn't raise any particular enthusiasm for either. Both flew well enough but their operating costs seemed far greater than the regular GA aircraft with which I had spent most of my life. Apart from the better visibility in the low-winged Golf, there was nothing between the two types in terms of training characteristics. I developed no specific likes for either the Echo or the Golf. Uninspiring in their handling, and not cost-effective to operate, they were just aeroplanes I could hire to get off the ground.

My Colby-503 – 10-1918, at YBOA.

The first aeroplane that I owned in Australia was a (the) Colby-503. The only one in the world, it was a one-off, constructed from unused kit parts of a single seat Pioneer Flightstar, and given a new title/type name according to CASA rules. When I bought it, it had just been fitted with a Rotax 503 2 stroke engine replacing the 477 it had been previously been powered with. It hadn't even been test-flown. It flew surprisingly well, mostly because its empty weight was a mere 154 kg. MTOW was 300 kg and, with 55 hp in front, was the only aircraft I can ever remember flying that could exceed its Vne (of 65 knots) in a climb. Its climb rate was absolutely sparkling. Using a stop watch and the altimeter, I got a calculated climb rate in excess of 1300 feet per minute at its Vy of 30 knots. Its Vx was a mere 26 knots and I annotated the POH I compiled for it to state that it was ill advised to operate it at these speeds after take-off as an engine failure would see a stall occurring before the nose could be lowered to an appropriate attitude for safe, unstalled flight. This aircraft was academically interesting, but held no personal preference characteristics.

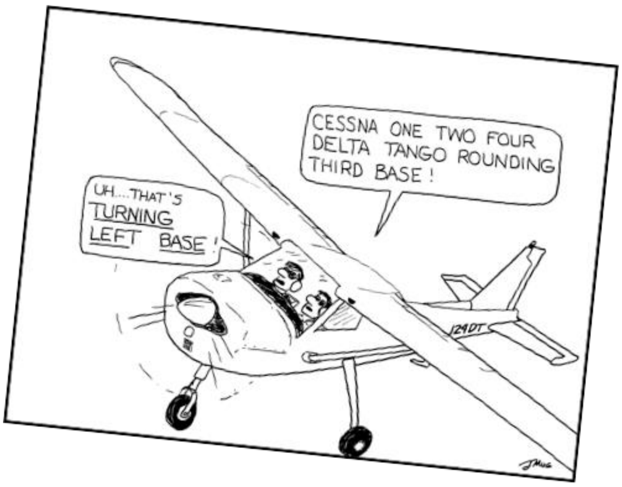
The Colby was followed by two more ultralight aircraft. Another very interesting kit from America, a Slipstream Genesis, and an Australian-built ALW GR-912. Like the Colby, the Genesis was interesting, but the GR-912 was a real delight. It was with great reluctance that I sold it when my eye sight issues became apparent.

The Slipstream Genesis – 19-3556, at YFRH.

My ALW GR-912 – 55-4448, at YBHN.

In conclusion, writing this has forced me to realize that I really have no specifically loved aeroplane type. It's being airborne, it's flight itself, that has been my life's love for 70-odd years, and the various aircraft types I mention are merely the platforms through which I have taken that enjoyment. I would also add that instructing has also made my love of flight deeper, as I have felt the greatest satisfaction in my life in giving others the ability to garnish their lives with the enjoyment of being airborne, as pilots in their own right.

Happy flying



The de Havilland DH-100 Vampire

By Rob Knight

Development of the Vampire as a conceptual experimental aircraft began much, much earlier than most people realize. It's first glimmer of conception came in 1941, during the Second World War, to exploit the revolutionary innovation of Frank Whittle's new jet propulsion engine. The de Havilland design studies led to manufacturing a twin-boomed aircraft, powered by a single Halford H.1 turbojet, which was later produced as the Goblin. Aside from its propulsion system and twin-boom configuration, it was a relatively conventional aircraft using, in part, the same construction materials and processes as the DH.98 Mosquito. With design work continuing through the war years, in May 1944, it was decided to produce the aircraft as an interceptor for the RAF.

de Havilland was approached to produce an airframe for the H.1 as insurance against Germany using jet bombers against Britain; this was considered more important than de Havilland's suggestion of a high-speed jet bomber. Initially designated the DH.99, the Vampire was an all-metal, twin-boom, tricycle undercarriage aircraft, armed with four cannon. Here, the use of a twin booms shrewdly enabled the jet pipe to be kept relatively short to avoided the power loss that would have occurred if a long pipe was used. Thus, the fuselage was unconventionally short. It also raised the tailplane above and clear of interference from the exhaust.

The DH Vampire. nicknamed by some pilots as "the aerial kiddie car'.

Performance estimates provided for a max level flight airspeed of 395 knots at sea level and initial climb of 4,590 ft/min on the Halford H.1's 2,700 lb thrust. The representative of the Ministry of Aircraft Production (MAP) expressed serious doubts in regard to the lack of detail, estimations for the aircraft's performance and optimistic structure weight, but the project received permission to proceed in July 1941. In 1946, the DH-100 entered operational service with the RAF, only months after the war had ended. The DH.100 was also purchased by other countries, some from within the Commonwealth, others outside this group, but in all cases, it provided excellent service for its operating life.

In production, the Vampire's pod was constructed mainly of wood and the wings, tail and booms were made from metal. While the aircraft was developed initially as a single seat fighter, it was subsequently developed into a night fighter, fighter/bomber and trainer versions. A total of 3,987 were built between 1943 and 1961 in six countries, including Australia.

TheDH.100 cockpit.

The DH.100 was always considered a delight to fly. It was simple (relatively) to operate, had no real vices in its performance envelope, and the RAF found it to be very cost-effective, especially compared to the twin-engined Gloster Meteor, the only other jet powered aircraft in the RAF's arsenal.

Entry to the cockpit was via small ladder clipped to the side of the cockpit (removable by the ground crew prior to start). The seats, fixed, fore and aft, could be raised and lowered to suit the pilot's requirements. With no fore/aft seat adjustment available, in common with the Airtourer series of light aircraft twenty years later, the rudder pedals themselves were each adjustable, albeit a bit too close to the instrument panel than ideal for some. However, comfortable these seats were not, especially for any pilot in excess of 5ft 10in.

As shown in the cockpit image, the stick followed the classic English style-of-the time-with its spade grip allowing the pilot to hold it with a natural wrist position.

The cockpit abounded in yellow and black wasp-striped levers, knobs and dials, all delivering warnings. They surrounded the flight instrument panel. with its RPM indicator, ASI, and JPT (jet pipe temperature) gauges conspicuously in front of the pilot/vampire student rather than the artificial horizon.

The Vampire's fuel system was unusually complex, with nine tanks. The early versions had a gauge for each tank but later marks only indicated the total fuel the system contained on a single gauge. The total fuel that could be carried in the early DH,100 was 200 imperial gallons (close to 900 litres). In later versions, drop tanks added additional quantities to improve range and/or endurance.

The engine start used an electric starter motor and a three-stage sequence controlled by a clockwork timer. Like any light aircraft, the sequence started with making electrical power available so the *Ground/Flight* switch on the lower centre of the instrument panel was switched from the *Ground* to the *Flight* position indent. Initially the starter turned slowly to prevent damage to the drives in the engine. After checking 900 RPM had been achieved, the second stage began and the starter motor increased speed. Fuel was introduced into the combustion chambers with the HP [high pressure] cock located adjacent to the throttle. Typically, then, the engine would start and observers would hear and see the steady rise in RPM and EGT. After 30-40 secs the starter motor disengages automatically. After the successful start, the ground crew pull out the battery cable attached to the external battery cart, remove the entry ladder and wheel chocks, and retreat to a safe position.

The Vampire DVA, or vital actions, checklist before take-off required pilots to perform only six vital actions. The pilot must set the trim to neutral, open the high- and low-pressure fuel cocks, activate the booster pump, set the flaps, and check the air brakes are retracted.

With ATC clearance and a personal lookout, an application of throttle sets the taxi in motion and the aircraft moves out onto the runway. Lining up, opening the throttle slowly sees the RPM rise and the whistling noise of the Goblin rising sharply. Initial taxi acceleration is not high but the engine begins to shriek.

For take-off, the throttle is *slowly* moved forward from idle, the JPT needle surges across the gauge towards the red line as the RPM rises toward 7,000 RPM. At that point the throttle movement rate can be increased so the RPM can rise more quickly to 10,000 RPM. Acceleration along the runway is still unimpressive, and the individual brakes can be used to assist directional control up to fifty knots, the point the rudders become effective. At 80 knots, the aircraft is rotated and it will fly itself off the runway at 110 knots after using less than about 1,000 metres of runway.

The climb angle should be held a little flat so the airspeed can rise, and the acceleration would also be increasing. Ensuring the slip/skid ball is centred, the brake lever to stop the wheels spinning is applied and the gear selected UP. This MUST occur before 175 knots is reached so Vle[1] is not exceeded. Retraction is quick - three seconds flat. It's important to get the gear up quickly if drop tanks are carried because aerodynamic interference between them and the doors makes it impossible to get the gear up and doors closed at higher airspeeds.

In flight the ailerons are very light and control harmony between ailerons, elevator and rudder make a perfect 1:2:3 ratio in their weighting. Power settings and flight times are always in the pilot's mind because, even at a low cruise/loiter airspeed of 150 knots, the Goblin is gobbling an average of 30lb

[1] Vle = Maximum gear extended IAS.

(approx 13.6 kg, or 17 litres) of fuel per minute. Yes, 17 litres *per minute*, or 1020 litres per hour. A perspective check indicates that Boeing 737s and Airbus A320s have engines that are ten times more powerful than a Goblin, and yet each burn about the same while carrying 200 passengers at 450 knots.

A limitation on the Goblin engine dictates that pilots are required to avoid operating it between 8,200 and 8,600rpm because a malicious harmonic gets generated, so severe it could destroy the engine if not corrected. It was sufficiently critical to have its own red band markings on the rpm gauge so pilots can't miss it.

De Havilland DH-100 Vampire MK35A two- seater trainer aircraft A79-831 shown on its delivery flight to Aircraft Research and Development Unit, RAAF Laverton.

In flight, aileron rolls are simpler than any light propeller-driven aircraft. Just pull the nose up a little, about five degrees instead of the more usual twenty to thirty, then, checking no pitch occurs, apply full aileron in the direction of intended roll. Suffering virtually no adverse yaw as the second effect of the aileron application, at 250 knots the Vampire goes around the lateral 360° in about six seconds.

Loops are just as easy, using an entry speed of 300kt and pulling 4g all the way round. Pressed into that uncomfortable seat, the world vanishes underneath the nose and blank sky fills the screen. Then, holding the stick and feet dead still, the world reappears, upside-down and refilling the screen with its own mosaic, before, effortlessly, level flight, the right way up, is re-installed. The handling of this aircraft is soo smooooth it's like a video game, every manoeuvre is easily done, long, gentle, smooth, and gracefully.

After 20 minutes of playing, sometimes with high power settings, the fuel gauge indication would be reduced perhaps to only about 700 remaining pounds from what the flight started with. Obviously, to go anywhere, air density is the enemy so higher cruise altitudes are required to get more economy miles flown per lb of fuel burned. In light of this, an ideal altitude for economic range would be 10,000ft-plus, at 300kt IAS and up to 400 TAS, but still burning 17 litres per minute. For the reason of economical range, later versions were given extra tankage and greater capacity in their drop tanks.

Returning to base, on the initial approach, airspeed must be reduced to 175knots or less for the gear to be extended. Then, also, the first stage of flaps can be lowered, before the aircraft trim is checked. Still reducing airspeed, at 160 knots the second stage of flaps can be extended and then, finally, the last flap stage at 140 knots. Now, with the added drag from the fully lowered flaps, the power must be raised to maintain airspeed and approach path. A complication that must be worked around is the 'bad' red-range on the dial.

Reducing speed to 120 knots on short final, and then down to 110 crossing the fence, the aircraft is set up for the flare and the hold-off. This sounds easier to do than reality dictates because through that changing speed range there are many fluctuations of the ASI caused by fluctuating airflow around the pitot head, another quirk of the type.

The touch-down itself is very straightforward, the nose held high for aerodynamic braking. Now just brakes to be applied and the taxi in.

Since its first flight in 1943 in the hands of Geoffrey de Havilland junior, the founder's son, the Vampire has held the flying world's attention and affection. Very economic to manufacture in its day, when new a mere £29,000 each, who knows what price might be asked for one of the very few still flying today. In all, remaining from the total of 3,268 Vampires of all types produced, there are very few left flying today. In Australia, it appears that a single T.35 version is airworthy with the Air Force Heritage Squadron at Temora, New South Wales, while another four are in various stages of restoration.

As a type, the Vampire was a huge success on the British export market, being sold overseas to ultimately equip the air forces of 31 nations over 40 years. During many decades of service some Vampires were shot down by fighters (including at least two downed by Gloster Meteors) however in all recorded cases the aircraft were being used in ground attack or reconnaissance roles.

Vampire Notes:
In July 1948, six Vampire F.3 aircraft from No 54 Squadron, RAF Odiham, completed the first transatlantic crossing by jet aircraft. The Vampires left Stornoway on Monday 12 July and made the 2,203-mile ocean crossing in a flying time of eight hours and eighteen minutes. The trip was accomplished on three legs. The first, from Stornoway to Meek's Field, Iceland (662 statute miles) took 2 hours and 42 minutes; the second leg from Iceland to Bluie West 1, Greenland (757 miles), was completed in 2 hours 41 minutes; and the final leg from Greenland to Goose Bay, Labrador (783 miles) took 2 hours 53 minutes. The Vampires cruised at between 25,000 and 32,000 feet – and occasionally higher – along tracts of the upper air over the Atlantic Ocean which were then almost unknown. The trip provided a wealth of information and experience which was to prove particularly useful to the future transatlantic civilian jet traffic.

To comfortably complete the transit, the formation required good visibility at both departure and arrival points, along with favourable winds at 25-30,000ft. However, the formation suffered considerable headwinds, up to a recorded 207mph at one point, some of the weather fronts encountered extending up to between 35,000 to 40,000 feet, while fog over the mountain-locked fiords added to their woes. The arrival of the first of six Vampires at Goose Bay at 1225 UTC on Wednesday 14 July 1948, was amid rain squalls driving across the airfield. Within a short time, all six aircraft had arrived safely, proving that ferrying a jet squadron across the Atlantic, along with its support crew and ground equipment (in piston-engine transport aircraft) was a feasible proposition.

The flying duties were shared among nine pilots from 54 Squadron, divided into three sections, Blue, Red and Black. The Stornoway-Iceland first leg was flown by Blue and Black sections, the Iceland-Greenland second leg by Red and Blue sections, while the final Greenland-Labrador section was completed by Red and Black sections – thereby ensuring that each pilot completed two legs of the transatlantic crossing.

An Australian RAAF DH.115 Vampire.

In Australia, de Havilland built 80 single seat aircraft at their Bankstown factory, with the first Australian built aircraft airborne in in June 1949. These were single seat fighter/bomber versions, powered by Rolls Royce Nene engines, these engines being built under license by the Commonwealth Aircraft Corporation (CAC) in Melbourne. Notably, these were the first jet engines built in Australia.

An ex-RAF FB.5 model, NZ5757 served with No. 75 Squadron, RNZAF, in the Fighter Operational Conversion Unit, and the Jet Conversion Unit at Ohakea between 1953 and 1960.

The New Zealand connection to the DH Vampire was substantial. The RNZAF operated more Vampires than any other aircraft type after WWII. A total of 58 in total, beginning, in 1951 to 1952, with the importing of 18 brand new FB.52 models being allocated to No 14 squadron, based then at Ohakea. These were followed by 6 T.55s trainers and 8 RAF used FB,5s in 1953 to replace accident write-offs. When it was decided that TAF (Territorial Air Force) pilots would undergo jet conversion training, a further 21 ex RAF FB.5s and 5 brand new T.11s were purchased between 1955 and 1956. Operationally, the Vampires served the RNZAF in the fighter-bomber role until the Canberras arrived in 1959 to 1961 and replaced them. At this time, they were reduced to training operations only.

PRESS RELEASE
In a major boost for Australia's Warbird movement, a fully restored and airworthy De Havilland DH.115 Vampire T55 has arrived in Scone, New South Wales, where it will join the growing fleet of historic aircraft operated by Paul Bennet Airshows.

Built in 1958 by F+W Emmen in collaboration with de Havilland Switzerland, this two-seat jet trainer was one of 39 Vampire T.55 aircraft used by the Swiss Air Force, with nine of the final batch sourced from RAF surplus stock. Operating under the Swiss serial U-1213, the Vampire served as a jet trainer until the early 1990s, logging approximately 2,500 flight hours before being retired. Following its retirement, the aircraft was sold and made its way through various owners in the United States and Canada, where it was restored in 2010 to its original configuration. It was painted in the Royal Canadian Air Force (RCAF) 442 City of Vancouver Auxiliary Fighter Squadron colors. Between 2017 and 2019, the Vampire underwent a second comprehensive restoration, which included a wooden forward fuselage overhaul, digital cockpit upgrades, rewiring, and the addition of larger external fuel tanks as seen on the DH Venom.

General characteristics of the DH.100 Vampire:

- **Crew:** 1
- **Length:** 30 ft 9 in (9.37 m)
- **Wingspan:** 38 ft 0 in (11.58 m)
- **Height:** 8 ft 10 in (2.69 m)
- **Wing area:** 262 sq ft (24.3 m^2)
- **Empty weight:** 7,283 lb (3,304 kg)
- **Max take-off weight:** 12,390 lb (5,620 kg)
- **Powerplant:** 1 × de Havilland Goblin 3 centrifugal-flow turbojet engine, 3,350 lbf (14.9 kN) thrust.

Performance

- **Maximum speed:** 548 mph (882 km/h, 476 knots)
- **Range:** 1,060 nm
- **Service ceiling:** 42,800 ft
- **Rate of climb:** 4,800 ft/min
- **Wing loading:** 39.4 lb/sq ft

Armament

- **Guns:** 4 × 20 mm (0.79 in) Hispano Mk.V cannon with 600 rounds total (150 rounds per gun).
- **Rockets:** 8 × 3-inch "60 lb" rockets
- **Bombs:** 2 × 500 lb (225 kg) bombs or two drop-tanks

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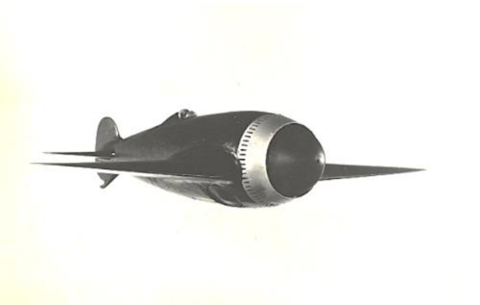
What Might Have Been – The Bristol Racer

By Rob Knight

The Bristol Type 72 Racer was a British racing monoplane designed by Wilfrid Thomas Reid and built in 1922 by the Bristol Aeroplane Company at Filton, England. It was built to demonstrate the capabilities of the Bristol Jupiter engine designed by Roy Fedden. Frank Barnwell had resisted the idea of a special aircraft, maintaining that the Bristol Bullet was adequate for the purpose, but when Barnwell left the company in October 1921, Fedden and Wilfrid Reid, Barnwell's successor as chief designer, started to work on a monoplane design featuring a wholly enclosed engine. Detail design work was authorised on 5 December, and an order issued to the factory for a single aircraft on 23 January 1922.



The Bristol Type 72, perhaps the English fore-runner of the USA's later and totally more successful Gee Bee Racers.

The final Bristol Racer design had a single-engine, a mid-mounted monoplane wing, and, unusual for the time, a retractable undercarriage. The 480 hp Bristol Jupiter IV radial engine was entirely enclosed within the circular-section fuselage, with an elaborate and extensive duct arrangement to channel cooling air over the cylinders. A large spinner with a central opening to admit air, constructed of laminated wood with internal wire bracing was fitted to provide streamlined flow into the open end of the cowl. The fuselage, which increased in diameter until the trailing edge of the wing and then tapered to a point, was built around a pair of circular steel frames to which the wing root stubs were mounted. Aft of this structure, the rear fuselage was semi-monocoque, built up from three laminations of tulipwood over hoops which were braced with radial wires. The fabric-covered wings had composite steel-and-wood spars and were designed as cantilevers, without bracing wires, and were parallel-chord with raked tips and deep full-span ailerons, which accounted for about 20% of the wing's chord. The undercarriage was retracted and extended using simple hand-crank and chain drive, the legs being housed in channels in the fuselage and the wheels within the wing roots.

The Bristol Type 7, over-powered and under designed.

A single aircraft, registered *G-EBDR*, was built in 1922 and made its maiden flight early in July that year. The flight revealed control problems caused by twisting of the wing about its spar, caused by the overlarge ailerons. For the second fight, bracing wires were added to the wing, but immediately after take-off on its second flight the spinner disintegrated, the debris causing damage to the wing covering, and the flight was restricted to a single circuit.

The first flight had taken place with the spinner unpainted: it had subsequently been painted, and the additional weight of the paint had caused the failure. A third flight, without any spinner, revealed that there was still a problem with the ailerons. An attempt to rectify this was made by fitting a device which produced a small control surface movement for small movements of the joystick, with the rate of control surface displacement progressively increasing as stick displacement was increased. This device, which used a cam on the bottom of the joystick to displace a pair of rollers connected to the ailerons, worked on the ground but under flight loads the rollers were pulled out of contact with the cam, resulting in loss of lateral control. Cyril Uwins the pilot, made yet another wide circuit in the aircraft and again managed a safe landing. For the next flight the cam device was removed and the control issue addressed by reducing the area of the ailerons to around 40% of their original area. At the same time a new spinner was fitted, this being designed to remain static. Three further flights were made, during the last two of which the undercarriage was successfully operated. Although the aircraft had been entered for the 1922 Coupe Deutsch de la Meurthe competition, and was allocated the racing number *1* which was painted on the tail, it was not in a fit condition to compete, and although it was suggested that it be used as an engine testbed, its flight characteristics were entirely unsuitable for this role and it was eventually scrapped in 1924. The Gee Bee Racers were far more successful.

Specifications

General characteristics

- **Crew:** one
- **Length:** 21 ft 7 in (6.58 m)
- **Wingspan:** 25 ft 2 in (7.67 m)
- **Powerplant:** 1 × Bristol Jupiter IV radial engine, 480 hp

Performance

- **Maximum speed:** 220 mph (190 knots) (estimated – never realized in flight).

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Flying in The Yellow

By Rob Knight

***Yellow infers caution, and any flight where the ASI needle points into the yellow arc on the ASI should be conducted with considerable care, and only in smooth air*.**

While some modern cockpits display the airspeed on a vertical speed tape, the same colour references apply so I will continue to work with the ubiquitous round-dial version with which most of us are more familiar.

The standard type ASI fitted to most light aircraft.
White arc = Flap Extension IAS range.
Green arc = normal ops IAS range.
Yellow arc = IAS for SMOOTH air ONLY, and no excessive control movements.
Red Line = V_{NE} – the NEVER EXCEED IAS.

For full comprehension of any topic, basic definitions must be clearly grasped. In this case it is vital that the meanings of the coloured arcs on the ASI[2] are understood.

To refresh, the white arc depicts the range of airspeeds permitted with flap extended. The low IAS[3] end of the white arc registers the stall speed with flaps lowered, and the top end designates the V_{FE}[4], the maximum IAS permitted with flap extended.

The green arc indicates the normal operating IAS range of that aircraft, that range of airspeeds within which most flying in that aeroplane occurs. Its lower limit is the stalling speed or minimum steady flight speed and the Upper limit signifies the V_{NO}[5], the maximum structural cruising speed - the highest IAS that this aeroplane may safely fly in any but the smoothest of air and, then, only with minimal control inputs. This is the point where the manufacturer removes any guarantee of the structural integrity of his aircraft – above the green range – St Christopher goes home - YOU ARE ON YOUR OWN.

The yellow arc is the cautionary airspeed range. Its colour warns that that any turbulence encountered whilst the needle indicates within this range may cause airframe damage leading to unthinkable consequences. Since few light aeroplanes can cruise in this speed range under most circumstances, we seldom spend any time understanding how very different the airframe overstress protection scheme is when operating in the yellow arc instead of the green one. It’s not just CASA giving us a colourful instrument to look at - there is a very good reason for this warning/caution range painted onto the dial of the airspeed indicator in front of us.

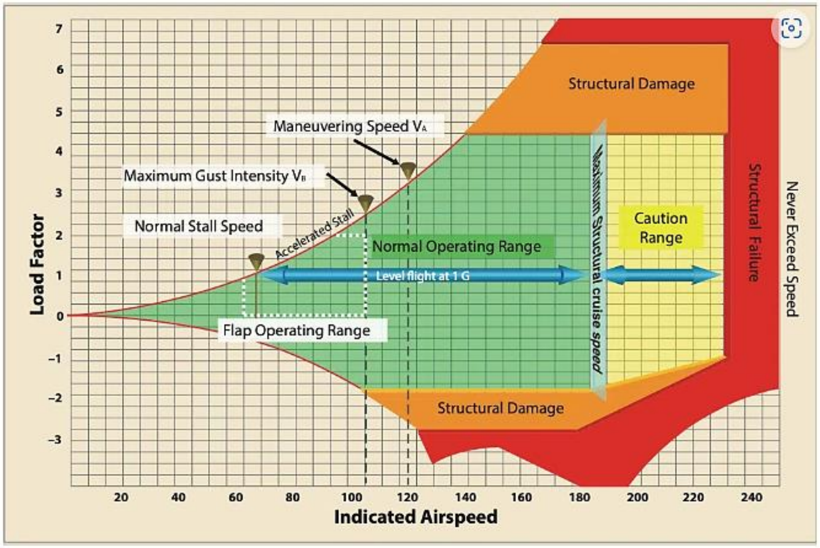
At the top end of the yellow arc is the red line which, like any other red line, indicates the end of the road if you exceed it. Perhaps this statement is a little extreme, but the manufacturer is giving you fair warning that it is absolutely unsafe to operate the aircraft, even in the smoothest of air, at an IAS in excess of this speed.

Unless you’re doing a CPL, you are not likely to be presented with a VG graph (aka VG diagram). However, aeroplanes fly for the same reasons and within the same parameters whether it’s an RAA certified pilot, a PPL, CPL, ALTP, or even an astronaut that’s holding its stick, so it certainly has general interest to everyone. In the vg graph, “V” represents velocity and “G”, the G loading (or load

[2] ASI – Airspeed indicator.
[3] IAS = indicated airspeed.
[4] V_{FE} = The maximum IAS with flap extended.
[5] V_{NO} = Maximum Structural Cruising Airspeed (maximum IAS for normal operations).

factor). Its design purpose is to present a visual image of the relationship between an aircraft's airspeed and the forces that accrue on the airframe when operating at those speeds. An example is reproduced below.

Note that all airspeeds are IAS values as they represent the forces the atmosphere exerts against the airframe. Caution: although specific stresses at very high speed may cause an aircraft's limiting speeds to be lower, the shape of the diagram would remain the same.



Sample of an FAA PHAK (Pilot's Handbook of Aeronautical Knowledge) graph. Note this its use of MPH rather than our knots as the airspeed measure

The sample VG graph on the right was extracted from the FAA's Pilot's Handbook of Aeronautical Knowledge (FAA-H-8083-25B. Colloquially known as the "PHAK") it is generic in that it uses airspeeds for a hypothetical aircraft. As noted in the PHAK, "each aircraft has its own Vg diagram specifically valid at a certain weight and altitude." The PHAK takes a stab at explaining this very complex diagram in a few words on pages 5-37 and -38. Readers of this publication that apply the definitions of the speeds that define the boundaries of the normal operating range and the caution range will quickly see how this diagram applies to the ASI's yellow arc. Note that the provision of VG diagrams is a modern innovation, older aeroplane type flight manuals and POHs will not contain such details in this visual format.

DEFINITIONS OF VNE, VNO, AND VA

Some pilots may be confused by the terms VNE, VNO, and VA. If you are one, then be assured that you are in good company.

In essence, each of these limiting airspeeds indicates a different level of airframe (and therefore aircraft occupant) protection against potentially overstressing the aeroplane's structure. These speeds can be defined as:

- VNE: **Velocity Never Exceed (Never Exceed Speed),** is the maximum IAS at which the aeroplane may ever be flown. This airspeed is the manufacturer's stated maximum airspeed for this design. It is indicated by a red radial line on the ASI face.
- VNO: **Maximum structural cruising speed,** is the maximum IAS at which you can safely fly this aeroplane design in smooth air. It is indicated by the upper limit of the green arc on an airspeed indicator. If you fly above VNO, - in the yellow arc (or "caution range"), and you strike turbulence, you could cause real damage to the aircraft structure.

- V_A: **Design manoeuvring speed,** not indicated on a coloured arc, this is the IAS above which it is imprudent to make full application of any single flight control (or "pull to the stops") as it may generate a force greater than that to which the aircraft's structural was designed.
  The primary reason that V_A is not displayed on a coloured arc is that the value is not fixed, as the other values are. The V_A varies with changes in aircraft weight, decreasing as the aeroplane weight decreases, and increasing as its weight increases.
  The published V_A is the IAS that applies at the airplane's maximum take-off weight. Flying at or below the design manoeuvring speed does not allow a pilot to make multiple large control inputs into one axis, or single control inputs in more than one axis at a time, without endangering the airplane's structure.

Most light aeroplane manufacturers recommend flying at (or preferably below) V_A when operating in turbulent air. This could be clarified by stating that in moderate or greater turbulence, the pilot should slow to a speed at which the maximum speed reached in gusts is still below the V_A for the aeroplane's current weight. If your POH only lists a V_A at your MTOW, then you'll have to guess. But be sure to guess with care!

Consider also, at the V_A, your aeroplane may reach its maximum G limit before the wings stall and unloads the airframe. It won't cause structural damage, but you'd be in for a pretty wild ride - changing from 3.8 or 4.4 G to zero G in an instant is a severe shake-up Slower is better, so long as the IAS remains above the aeroplane's minimum control speed whilst experiencing the turbulence.

Lastly - these airspeeds, potentially so vital to airframe protection in turbulence or while manoeuvring, occur within the green arc, the normal green operating range as depicted in the previous images. They are NOT restricted to the yellow arc alone. Therefore, when operating within the ASI's yellow arc, it would demonstrate an extreme lack of wisdom to subject the airframe to any turbulence or savage/extreme control inputs whatsoever.

Aircraft certification rules are quite clear. They require establishing limit speeds that provide protection against damage to the aeroplane when operating in the green arc based on encountering a 30 fps wind shear. That's a rapid, 1800 fpm change in wind speed or direction. This means that if you remain below your maximum structural cruise speed (V_{NO}) and impact a shear of this extent, no permanent damage should occur (whew, that's good news).

Certification rules for piston-powered aircraft give the manufacturer a break at V_{NO}. At any IAS above the V_{NO} the wing has only to withstand a 15 fps gust, or 900 fpm, up to red line, VNE. Read this as meaning that your structural protection is cut in half above your aeroplane's V_{NO} because above this IAS the aircraft has the control authority to exceed its maximum load factor. That's why the yellow arc is the "CAUTION" range, and why you'll want to remain in the green arc except in very smooth air.

LOAD FACTORS AND "G" METERS

It's true that there is a deliberate margin between design or limit load, specifically the published maximum, and the ultimate load. Ultimate load is 150 percent of design load—for the utility-category airplane depicted in the previous Vg diagram, design load is +4.4 g and ultimate load is +6.6 g. But there is a significant difference between the two—you don't have the same protections all the way to the ultimate limit.

For certification, aeroplanes must endure up to the design load without damage to its primary structure. The aeroplane is designed to not suffer catastrophic failure of its primary structure unless it exceeds the ultimate load limit. However, note that, in the grey margin between design and ultimate limits, the aircraft's primary structure will likely be damaged or permanently deformed, just not damaged so severely that the aeroplane breaks up in flight. In other words, exceeding the design load limit may not pull it apart, but it is still capable of severely damaging the airframe to the extent that, after the termination of that flight, it is beyond economic repair from an airworthiness point of view. Same thing, really, for the aeroplane – but you survived even though the aeroplane did not.

Flying in the YELLOW

So, what's the verdict? Is it safe to fly in the yellow arc?

In general, the answer is "Yes", But, only as long as you have complete certainty that:

I. you will not meet anything more severe than the lightest of turbulence; and/or

II. you will not need to apply any flight control (elevator, aileron, or rudder) to its maximum deflection to counter the effects from a gust, to recover from wake turbulence or because you choose to make an abrupt manoeuvre, and/or

III. you will not need to apply some undefined amount of flight control input (aileron, elevator, or rudder) to more than one flight control at the same time.

In other words, **IF** you can be confident and sure that you can continue to fly with essentially no change in control position, **AND** the air is predictably smooth, **you may be safe** flying with the IAS needle indicating in the yellow arc.

HOWEVER - You'll need to have a good level of knowledge of the factors that may cause turbulence, and a corresponding high degree of situational awareness as to how the conditions may have changed since your last weather update. Unless you have absolute certainty that you can maintain essentially neutral flight controls and avoid turbulence, it is not safe to fly in the yellow arc.

Aerodynamic drag on an aircraft rises as the square of the value of the increasing IAS. Therefore, it's easy to see that all the forces acting on the aircraft will rise as the square of the speed rise. With this in mind, the higher the ASI needle indicates into the yellow arc, the greater all aerodynamic forces will be to act on and potentially damage the structure.

To Conclude

The yellow arc covers a range of indicated airspeeds derived during the certification process for that specific aeroplane type. The yellow arc depicts a regime in which the aeroplane will withstand only very minor turbulence and/or very small control deflections, and where there is no longer any built-in airframe protection to prevent dangerous overloads, such as exists at lower speeds. The yellow arc is, indeed, an IAS speed range to operate in only with extreme caution.

Happy Flying

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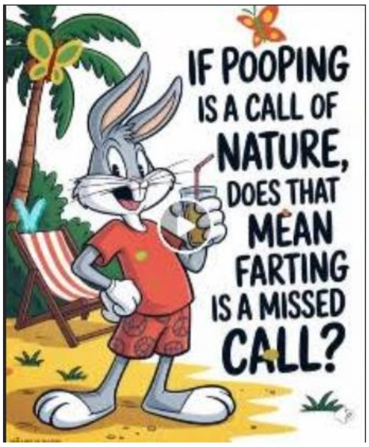
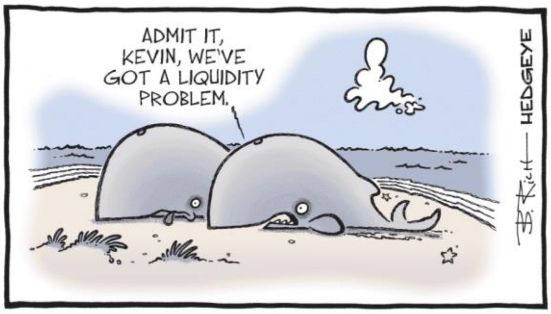
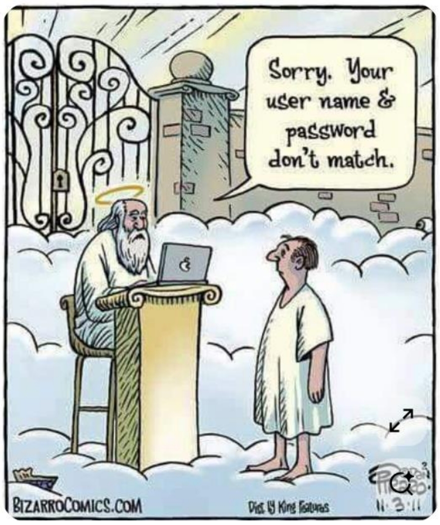
Fly-Ins Looming

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







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WTF - The World's Worst Aircraft – The Blackburn Botha of 1938

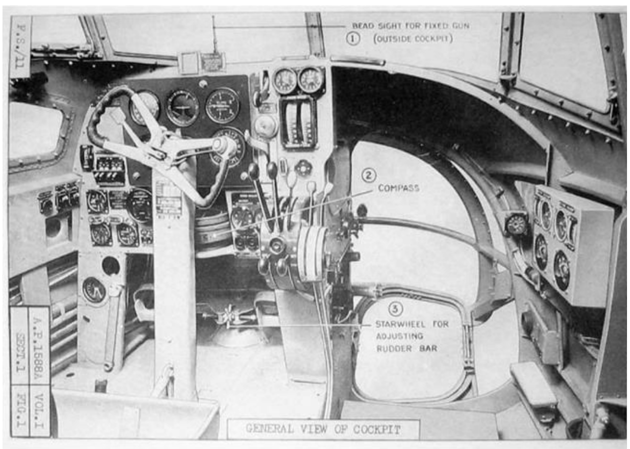
By Rob Knight

This torpedo bomber, which proved far more dangerous to RAF pilots than it did to German sailors., was designed to compete for the same requirements that produced the Bristol Beaufort and was originally intended to be powered with the same 1130 hp Bristol Taurus engines as the Beaufort. A shortage of these engines meant that the Perseus X, rated at only 880 hp, were used for the initial versions. The deficit in engine power, and a series of unexplained accidents post 1939 led to the Botha developing a very poor reputation for performance or handling. Consequently, a slightly more powerful version of the Perseus was fitted and other small changes were made but these had little effect on the overall accident and incident rates. This was particularly pertinent in that the Botha was allotted to training units where inexperienced students were exposed to its shortcomings. Despite its shortcomings and inadequacies, nearly 600 of these deservedly unremarkable aircraft were delivered to the RAF. From the 580 actually delivered, nearly 22% were subsequently destroyed in accidents.

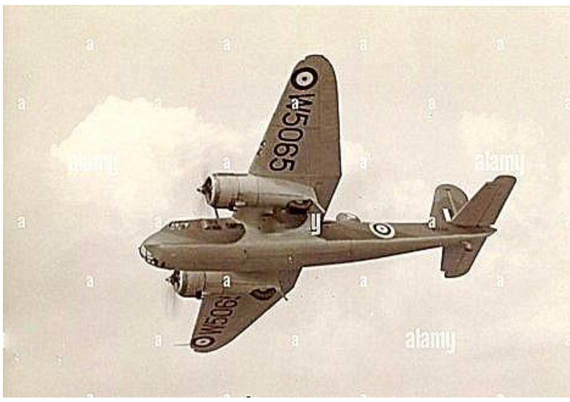
One of the more spectacular accidents occurred in 1941 when a Botha and a Boulton-Pail Defiant, two seat fighter, collided in poor visibility just off the seafront at Blackpool. The Botha, minus its tail and much of its left wing, spun and crashed onto the Blackpool Central Railway Station, killing several people on the ground and doing severe damage to infrastructure. Tragically, the crews of both aircraft failed to survive.

The Botha never made a bomb or or torpedo attack in anger. It ended up being used in a training role where it was more dangerous to the allied effort than to the Germans it was supposed to fight. Its cockpit layout was deplorable, it's fuel taps were located in such a manner that that changing tanks or turning a fuel tap off, was likely to see the ignition switches also inadvertently knocked to their off positions. The layout of the wings and engines provided extremely poor pilot/crew visibility and there were blind spots to spare allowing for easy enemy attacks. It's wing loading was too high and its highly tapered wing in plan form provided poor stalling and recovery characteristics.

The type ended its service life ignominiously as a target tug, no other practical use being found for it, and it was officially withdrawn from service in 1944.



The Botha cockpit



The Blackburn B-26 Botha

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

1. On a TAF, a pilot sees the abbreviation "BR" Which of the following does this indicate?
   A. Fog.
   B. Mist
   C. Falling/decreasing OAT
   D. Turbulence.

2. Upon which of the following does an aeroplane's rate of climb (Vy) depend?
   A. Surplus lift.
   B. Surplus thrust.
   C. Surplus horsepower.
   D. Surplus airspeed.

3. Which of the following will minimise an aeroplane's adverse yaw?
   A. Frise ailerons.
   B. Differential ailerons.
   C. Correctly applied rudder.
   D. All of the above.

4. A balloonist is suspended between two large cloud formations at his altitude, one to the north, and one to the south of his position. The northerly formation is 3 nm closer than the one to the south. If the W/V is 360/15, which cloud formation is he most likely to enter?
   A. The southerly formation.
   B. The northerly formation.
   C. Neither, the balloon will not enter cloud as long as the situation remains unchanged.

5. The METAR at 2330 zulu provides that the surface wind is 120/25, and the 0000 zulu METAR states a surface wind change to 140/25. How would the directional change to this W/V be correctly described?
   A. As a veering wind.
   B. As a backing wind.
   C. As a keening wind.
   D. Neither as the wind speed is unchanged.

If you have any problems with these questions, call me (in the evenings on 0400 89 3632) and let's discuss it. Ed.

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 +61 4 0089 3632), or email me at kni.rob@hotmail.com.

ANSWERS

1. B is correct.
   MIST A suspension in the air, at or near the earth's surface, of microscopic water droplets or wet hygroscopic particles which reduce the horizontal visibility to less than 5000 metres but not less than 1000 metres. In aviation forecasts and reports it is coded as BR.
   See http://www.bom.gov.au/aviation/data/education/taf-reference-card.pdf.
   And: http://www.bom.gov.au/aviation/data/education/glossary.pdf

2. C is correct.
   An aeroplane's rate of climb depends surplus horsepower, i.e., that horsepower available above and beyond that necessary to equal aerodynamic drag.
   See: https://www.flightliteracy.com/aircraft-performance-climb-performance/

3. D is correct.
   Adverse yaw is always created when aileron is applied but the force causing adverse yaw is minimised by the design features of frise ailerons and differential ailerons. However, when rudder is correctly applied to counter it when aileron is applied any/all residual adverse yaw is eliminated. Thus options A, B, and C are all correct
   See: https://www.youtube.com/watch?v=D9clof2O6Mc

4. C is correct.
   As both cloud formations and the balloon have the same ground speed (they are at the same altitude), the wind will be the same velocity for them all. Therefore, they will remain in their positions relative to each other as they drift across the landscape below and will not get nearer to or further from each other. The balloon will enter neither cloud formation as long as the current situation exists.

5. A is correct.
   VEERING A clockwise shift in the wind direction.
   A backing wind occurs when the directional change is anticlockwise, and a keening wind is one that is extremely cold and penetrating so does not reflect any change in direction
   See: glossary.pdf (bom.gov.au)

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

Aircraft Books, Parts, and Tools etc.

Contact Rob on mobile – 0400 89 3632

Books

Title	Condition	Price
PPL Navigation, by Trevor Thom	Good condition	**$15.00**
PPL Basic Aircraft Technical Knowledge, by Trevor Thom	Excellent	**$15.00**
Manual of Aviation Meteorology, by the BOM	Excellent	**$15.00**
Human Factors in Flight, by Frank Hawkins	Excellent	**$15.00**
Aviation Medicine and Other human Factors, by Dr Ross L. Ewing	Excellent	**$15.00**

Aircraft Magnetic Compass (Selling on behalf)

Item		Price
Magnetic compass: Top panel mount, needs topping up with baby oil.		**$45.00**

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@hotmail.com

Aircraft Grade Bolts for Sale

<u>**Aircraft AN Bolts - $500**</u>

AN3, AN4 & AN5 bolts, all bagged
- 500 bolts in total.

Today's cost – approximately **$5,500**

A list can be supplied if required

Contact Colin Thorpe –

0419 758 125

Morgan Cheeta Aircraft for Sale

- Registered 19-1502 and paid up until July 2025.
- Power Plant: Jabiru 2200 with the cold start kit & 1.2kw starter motor.
- Propeller: Sensenich 68" ground adjustable.
- Icom radio, 2 headsets, Sigtronics intercom.
- Flight Instruments: Airspeed indicator, altimeter, vertical speed indicator, slip/skid indicator.
- Strobe lights.
- Fat beach tyres & Matco. Brakes.
- 93 litre fuel tank.
- Leather seats.
- 100 Knots cruise.
- TTIS – 32.0 hours engine & airframe.

NEW PRICE - $36,000

Contact Colin Thorpe
Ph. 0419 758 125

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**

2000 Parker Teenie Two for sale

NEW PRICE$9,500

- ✓ TTIS 70 hours airframe.
- ✓ Engine: 1835 cc Volkswagen with dual ignition and dual spark plugs, Slick mag, and 12-volt electronic ignition.
- ✓ Built by original L.A.M.E. owner.
- ✓ Price includes weatherproof storage/transport trailer so no hangarage is required.

I purchased the aircraft in 2020 intending to enter Recreational flying, but due to work and study commitments, it never eventuated.

The aircraft last flew in 2017. I start the engine every three months and have serviced it yearly. It really needs to go to someone who can enjoy her.

Contact me, Jared Tucker, at jaredtucker1998@gmail.com,

or call me on **0450 233 263**.

See you next month. It's my last issue so don't miss it!