BRISBANE VALLEY FLYER

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www.bvsac.com.au

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

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I wonder when Santa's sleight has to ge electric?

SPECIAL XMAS EDITION – GET YOUR COPY OF THE PILOT'S NOTES FOR SANTA'S SLEIGHT – APPENDIX-1

Contents

From the Club

Hello all,

Another year has come and gone, and what a roller coaster ride it has been with the Covid-19.

The way things are looking next year should give us more certainty, let's hope anyway.

It has been a pleasure to meet with all the members that come to the monthly meeting throughout the year, please keep the meeting going in the New Year.

Remember the club Christmas Party will be on the Saturday the 4th December, if you are coming, please RSVP so we will have the numbers.

In conclusion, the committee would like to wish you and your family a Merry Christmas and a prosperous New Year. Stay safe, and flight straight, until we all meet again next year.

Peter

Peter Ratcliffe
President BVSAC

Mysteries of the VSI Exposed

The Vertical Speed Indicator examined

By Rob Knight

This instrument sits soundlessly on the instrument panel, quietly doing its job in providing the pilot with three important details relating to the current flight status of the aeroplane. Is it going UP? Is it going down? If neither, then it's indicating level flight by inuendo? At a pinch, it can even advise the pilot of the aeroplane's RATE of ascent or descent which can be important for instrument flight. Obviously, then, this instrument can be very helpful to the pilot as a vertical position trend indicator.

The instrument is known by many names. Many glider pilots refer to it as the variometer, but it is also known as a Rate of Climb Indicator (ROCI), or Vertical Velocity Indicator (VVI). In Western countries, the VSI is calibrated in feet per minute (FPM) but elsewhere the calibration can be in metres per second (MPS) or even in knots (NMPH).

ZK-CRG. Note the "then" full panel did contain a VSI in 1969

The 90 hp PA-18 Cub that I started my training in never had a VSI. In the 1960s, it was considered too expensive to put in a mere training aeroplane, and a waste of potential payload, even though the instrument is, in itself, not particularly weighty. Height maintenance or otherwise was the result of watching the steadiness of the altimeter's hundred-foot indicating hand, and for changes in the airspeed indicator reading. In other words, by the secondary implications of two other flight instruments. I might add that this was pretty typical of the instrument arrangement in most trainers in that part of the last millennium and we never knew or expected any better. If you had a VSI then you were lucky and you used it. But by the late 1960s, a change had appeared in sales attitudes, and better equipped instrument panels were seen as a sales advantage so new aircraft began appearing with this better equipment already installed.

How does a VSI work?

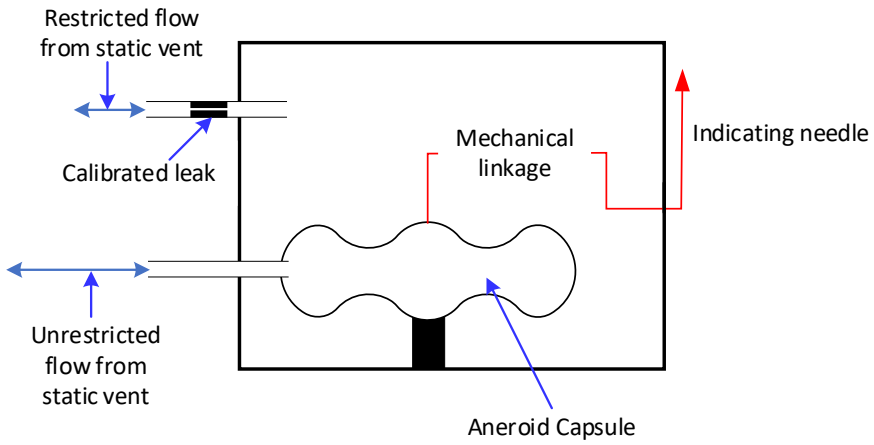
It's very simple! The VSI mechanism is sensitive to changes in atmospheric air pressure and indicates the rate of change of pressure with a needle reading against a scale calibrated in feet per minute.

The instrument contains a diaphragm, an aneroid metal capsule, that is open only to the static pressure vent and is sealed to everything else. Any movement, expansion or contraction of this said capsule, is exported by a mechanical system to the needle for the pilot to read against the scale. The instrument case is sealed, also to all pressure influences except the same static pressure that exists inside the capsule. Thus, the inside of the capsule and the inside of the instrument case are subjected to the identical static pressure value only

The inside of the instrument case is also open to static air pressure. However, the supply line to the instrument case which surrounds the capsule, has a calibrated leak, a narrowing of the orifice through which the static air must pass to enter or exit the case. Because of this

restriction to free flow, static pressure takes time to equalize inside and outside the capsule, and this pressure differential is really what the needle is indicating.

The sketch below is a schematic view of the instrument's functioning parts. Simply put, as the instrument ascends, the capsule will collapse as the pressure in the case will be held to a higher value unto the calibrated leak has allowed the pressures top equalize. Also, the greater the rate of ascent, the greater will be the degree of collapse of the capsule and so the greater the "rate" of climb indicated



Conversely, if the instrument descends, the capsule will expand because the pressure will increase inside the capsule faster than the calibrated leak will allow the pressure in the case to equalize. When the aeroplane returns to level flight, after several seconds, the time it will take for the air to equalize through the calibrated leak, the needle will return to zero because there is no longer a pressure difference between the interior of the capsule and the interior of the instrument case. As I said, it's all very simple!

The calibrated markings on the instrument face can differ widely between manufacturers. Some are sparse, indeed, with markings only 500, 1000, and perhaps, 1500 feet per minute rates of climb or descent. These are usually older instruments. Others may indicate rates of climb or descent in units as low as 50 feet per minute.

A common VSI presentation indicating 320 FPM climb

There are also instantaneous reading VSIs. These use air pumps to prevent lag in the instrument. Few are currently fitted to light or ultralight aeroplanes.

Some glass cockpit panels present the instrument in a pure digital readout format where the pilot must interpret the indications.

Happy flying

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

Childers and Frazer Island

by Rob Knight

With the COVID lockdowns and social distancing, socialising amongst the aviating fraternity has taken just as big a hiding as any other part of our society. Thus, a suggestion to pay a quick and social visit to Childers with the added attraction of a trip around Frazer made a great deal of sense.

Bob Burns from Heliodon, in his Jodel, along with Greg Davidson from Boonah in his FK9, and me, in my Lightwing, left for Childers (YCDS) on October 8th, each departing and making his individual way. The GAF was OK, but the details provided in regard to smoke haze and the resulting issues with visibility left a lot to be desired. For me, tracking from Coominya to Conondale was fine, but haze in the sector from Conondale, paralleling the ranges and past Gympie, whilst perfectly legal, made map-reading almost impossible, and reverting to DR navigation with headings and times was the only alternative.

Viz was quite good to crossing the range to Conondale

The forecast wind was correct – in that it was from the west, but instead of 350/21 it was closer to 270/35 knots. And the given FEW SC became 7/8 SC by abeam Gympie. I elected to descend beneath it and I entered the most entertaining part of the trip up as I encountered both the thermal turbulence causing the SC, and the mechanical turbulence from the strong westerly tumbling down the range to the west of me. With the visibility limiting my visual range, I added 10 degrees to my planned heading and tracked slightly east to ensure that I didn't miss Childers in the haze. It worked out fine – I found Howard out to starboard, and the main road east, and followed that to the airfield. At 0828, my mains kissed the grass at YCDS, 21 minutes ahead of my planned ETA.

Stratocumulus developing

Bob, in the Jodel D18 he built

Just a few minutes later Bob arrived in his Jodel, having followed a different route up that appeared to cause less trauma. He parked beside the Lighting in front of the hangars and we waited for Greg in the FK9 and Peter for a cuppa.

Greg and the FK9

Neither was long and we soon had the aircraft unloaded and we were sitting in the shade.

We planned a local scenic in the afternoon, to get the lie of the local environment, plus the Coral Coast can be very spectacular in the late afternoon sun with an orange sunset and lengthening shadow streaks.

Burrum Heads in the setting sun

At about 1610 we departed and tracked northward to Burrum Heads. At low water, these are truly spectacular, with the serpentine flows of the many waterways leading out, through the shallows and sands, to indigo blue of the Coral Sea.

Elliot Heads, ahead. Notice the haze hiding the horizon

We turned left at the coast, and headed north towards Elliot Heads and Bargara, Peter's home town. As anticipated, the late afternoon air was almost still, turbulence was zilch and 4448 flew herself. The only fly in the ointment was the ever-present haze. Not as prevalent as earlier in the day, but definitely continuing to limit greater visual ranges.

Elliot Heads passed under the wheels as we watched fishermen, with rods and nets, trying their luck. No whales, they must have had a later spot on the time schedule.

However, as the light began to fade, there was a very noticeable thickening on the haze that was killing the remaining daylight, and we made an early return to Childers ahead of the unexpectedly early onset of darkness.

The Lightwing hiding its cockpit

The Lightwing's wings were at least a metre wider than Peter's hangar doors so we put Bob's Jodel in there for the night. We managed to get the Lightwing's nose under the roof of the Isis Aero Club's Clubroom's shelter while Greg hunkered down with pickets and a cockpit cover behind the hangar. No inclement weather was anticipated, but, as the saying goes, "Although God looks after your donkey, you'd better tie it up as well", and the three aircraft were as set as we could make them before we went out and foraged through our rations for something for dinner. After the delightful brazier encouraging conversation and socialising burned low, we wandered off to get some rest.

Peter's hangar with Jodel inserted

The following morning, bright and clear, we planned the day around a circumnavigation of Frazer Island. After a half hour planning, the group mounted up and rode out, heading initially, once again, to Burrum Heads as that is an ideal point to begin the track south east to Hervey Bay. After the frequency change to their CTAF, we tracked across their extended centre-line, and headed past Point Vernon. Torquay passed 1000 feet under our tires before we headed across the first stretch of water to Big Woody Island. From there it was just a few miles over the wet to Frazer, itself, where the ceiling was considerably darker and lower, with still dispersing cumulus. In the gloom beneath the near overcast at that time, the Island looked dark and foreboding, almost menacing. The darkened ceiling whispered the potential for drizzle patches hiding in the gloom but none materialised. Then a right turn headed us East, across the Island towards Eli Creek, and from there conditions improved.

Hervey Bay and its Airport YHBA

Big Woody Island ahead, Frazer behind it

Apart from a large exposed sand blow, there was little to see at Eli Creek: I couldn't even locate the strip that I'd been told was there.

We turned right to fly up the Frazer Coast And we could see a great improvement in the weather ahead. The cloud was fast evaporating. The visibility was stretching like elastic and the deep blue ocean separated by the surf of the stark island coast stretched ahead.

My first impression was of the wilderness that covered so much of the Island. Now the visibility was getting better by the minute and I could actually see the island landscape, it brought home that this really is a large Island that has a small population on it. Depicted as a 4WD heaven, I could see that it had to be because there were very few visible roads and all the vehicles in sight were making a motorway of the sand along this ocean beach.

The local; motorway. There are 12 cars on the beach in this image

Campers abounded, all nestled in against the steep sand cliffs behind the beach. Some very expensive caravans and some just groups of tents. A few I could identify as self-contained, large sized motorhomes, worth a fortune, all exposed to a surging surf about 100 metres away. The fishing must have been good, although I never saw anyone fishing: Mind you, I never saw anyone surfing, either. The surf was not continuous, there were dark blue areas where rips were running and the waters were deep. Such areas can be seen in the image above.

Along the back strait, to Indian Head

We continued along the beach, heading north towards Indian head. The beach traffic never reduced in numbers nor did the frequent camp sites. It crossed my mind that if the engine spluttered, I'd be making a bee-line for that long stretch of sand and chancing the traffic, the waters were too rough and too deep for any other decision to be sensible.

The Island appears to pierce the heart of the Ocean. Orchid Beach Airstrip is hiding behind the blur on the windscreen

At Indian Head, another left turn led us across Middle Rocks, then past Waddy Point. Then Orchid Beach opened up before us. It's a very picturesque location, and the manner in which Orchid beach swept away in its gentle curve, with its piercing white Rangiputa sand tends to remain in one's memory. The surf looked enticing from that height, and the island swept away, northwards, with the deep blue of the Coral Sea on both sides.

Orchid Beach Airstrip was discussed at the briefing, and some wanted to land there just for the sake of doing so. However, the high landing fees put everyone off, and as the runway surface condition was unknown, we decided to be happy with photographs.

The turquoise waters of Wathumba

We crossed the Island at Orchid beach and headed for Wathumba. It was easy to spot in the distance as it had an estuary with the most amazingly turquoise coloured

water. As we crossed the island, looking northwards, it was possible to see some of the many sand blows for which the island is renown, clearly visible, stark, and clear of vegetation. With Peter doing all the flying for me, I looked pretty hard for sharks at Wathumba, expecting to see plenty, but they must have been having a day-off, too as the pristine waters were spotless.

We were now heading south west, and on our way home. This side of the island had different characteristics to the ocean side – it was all low lying and there was no surf: the sea was a flat as a five dollar note after Inflation, the smooth water cosying up to the white sand.

There was some activity here, too, although not as much as was visible on the ocean coast. Several boats were to be seen, some pulled up onto the sand, others fishing in the smooth waters off the beach. Caravans were dotted periodically amongst the trees forming the inland edges of the sand and there were several groups of vehicles parked up in the shade.

Away ahead is Moon Piont, our jump-off to the mainland

Looking out onto the water, there were several; larger tourist boats, all hunting whales. Not now with harpoons, but with cameras, and lots of "oohs" and aarrs" in various languages. I was surprised at their speeds, but I guess that the need to get out and back quickly, before the whales leave, and to avoid bad weather would dictate this. Apparently neither whales nor weather were happening on that day.

Tourist watching boat and a sport fishing boat, locked in a speed contest

Moon Point slipped beneath the nose and we changed heading slightly and tracked for Pelican bank. However, like the whales, there were no pelicans at home, either, so we continued on to Hervey Bay. It was now around 0945 AEST and the sky had cleared completely. All local cloud had burned off, and all that remained was the build-up of SC on the distant horizon. The winds were light and there was virtually no turbulence as the thermals were not yet big enough to flex their muscles. Our group of three aircraft tracked casually along the coast to Burrum Heads and returned to Childers. the flight time for the trip was almost exactly two hours

Burrum Heads ahead. Then make a left turn for Childers

We had been watching the weather pattens with some alarm and decided to cancel the plans for further flying that day and to prepare for an early departure for home early the following morning. We were up before the first kookaburra and had packed the aeroplanes under a low overcast which Peter assured us would clear. It did and I was the last one airborne at 0634.

Initially it wasn't too bad. The wind had picked up and I had a smart tailwind, but the visibility through the smoke haze dropped markedly and by the time I was abeam Maryborough, I was looking at around maybe 12km visibility. I was considering my options and looked at what was on top but climbing to 5000 feet only showed me further rising cloud tops. Both Greg and Bob had decided to return via the direct route and had climbed to their necessary altitudes further north. I either returned to the Childers area and climbed but it might be already too late for

that, or I went back down and looked to see if the cloud broke further south and I could sneak through with safety.

At Kenilworth I simply ran out of visibility. I now had a solid overcast of Sc at around 1800 feet QNH smothering a dense layer of smoke haze. The result was a complete blackout with the viz well below required limits. I swapped ends and headed north, back towards Gympie: I could wait there until it cleared enough to be safe to continue. Gas was good – I still had 3 hours, plus an hour or more reserve in the tanks. Then, as I was abeam Imbil, there was lightening along the ridge to the west. I dropped down to 1500 feet and the area to the west was spotted like a leopard, with area of yellow sunshine showing the cloud cover inland was breaking up.

Watching the change, I noted the cloud base around me was also rising so I turned left and flew towards the ridge. The weather was indeed improving: it was clearing very quickly, and I was soon at 3000 feet with the remaining cloud still a good 1000 feet above me.

The Jimna State Forest was easy to identify, as was the township itself. Now the issue was no longer cloud, but wind and I was experiencing some rather severe turbulence. Map reading became impossible for a while, especially as I flew south east, along the valley northwest of Kilcoy. I checked my groundspeed and it read 112 knots, that not bad for a Lightwing! Move over Concorde, the GR's comin' through!

The rest of the flight was lumpy, very lumpy at times, but otherwise uneventful and I was feeling very comfortable when I descended approaching Coominya and the turbulence reduced. There was the final challenge of a 10-knot crosswind on landing on 30, and I taxied off at 0802. As I had departed Childers at 0636, the total elapsed time was a mere 1 hour and 26 minutes.

Bob and Greg had also found some lumps in the air. But they, too, had arrived safely home after a most enjoyable couple of days in the cane-country up north.

I plan a return to Childers in the near future. I had hoped it might be before Christmas, but the seasonal weather looks as if it might be too disruptive this year. On the next trip I'd be looking at visiting Biggenden and Monduran, north of Childers, and maybe a couple of other places around there as well. If you'd like to tag along, why not email me and I'll keep you posted.

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

Confucius did not say:

Man who wants pretty nurse must be patient

Lady who goes camping with man must beware of evil intent.

Man who leaps off cliff jumps to conclusion.

Man who eats many prunes get good run for money.

War does not determine who is right; it determines who is left.

Man who fights with wife all day get no piece at night.

Man who drives like hell is bound to get there.

Man who stands on toilet is high on pot.

Man who lives in glass house should change clothes in basement

And finally, Confucius Definitely Did Not Say.
"A lion will not cheat on his wife, but a Tiger Wood.------ ooOOoo ------

Did A Grumman F11 Tiger Shoot Itself Down?

Is it possible for an aircraft to be so fast that it can actually outrun its own bullets?

By Desiree Kocis (October 4, 2021)

Early in the days of jet fighters, rumours started circulating about a Grumman F11F Tiger that shot itself down. Is that even possible, though? Photo By U.S. Navy, Public Domain, Via Wikimedia Commons.

In the early 1950s, aircraft designers began modernizing the F9F-6/7 Cougar—beefing it up with greatly reduced drag and supersonic speeds. When the redesign was completed in 1953, the result was a completely different aircraft than the Cougar. This new model was equipped with full-span leading-edge slats, trailing edge flaps with spoilers instead of ailerons for roll control, and wings that could fold down for easier storage on aircraft carriers. On its maiden flight in April of 1955, the now-complete Grumman F11F Tiger showed off its supersonic capabilities by nearing the speed of sound (Mach 1). Impressed, the Navy ordered the development of more than 400 for service, and it became the aircraft of its Blue Angels flight team.

Despite its initial popularity, the Tiger quickly proved flawed: Its engine was unreliable, its range and endurance inadequate, and its performance inferior to other aircraft produced at the time, such as the Vought F-8 Crusader. By 1959, production ceased. The Blue Angels continued to fly it for another 10 years before it was switched out for the McDonnell Douglas F-4 Phantom II. While its time in service was short, its early-day supersonic speeds left a legacy—most famously because it was the first aircraft to be so fast that it shot itself down.

On Sept. 21, 1956, young U.S. Navy test pilot Tom Attridge took off in an F11F Tiger (BuNo 138620) from Long Island, New York, for a weapons test over the Atlantic. He climbed to 20,000 feet, started a Mach 1 dive, and fired two bursts of rounds from his 20mm cannons until the ammunition was expended at 13,000 feet. He continued his dive, and around 7,000 feet something powerful struck his windshield. Thinking it must have been a bird, he quickly realized he had a big problem on his hands—his plane was losing power.

Pulling up, he throttled back to 230 mph and began a return to base. Unable to maintain altitude, he attempted to apply more power, but the power would not exceed 78%. The plane went down into a sea of trees approximately a mile shy of the runway, traveling 300 feet and catching fire. It was a total loss. Attridge suffered a broken leg and several broken vertebrae but thankfully survived. As he later learned, it was not a bird that took him down. As it turned out, the crash was caused by a far more surprising source: his own rounds.

Many believed it was impossible for an aircraft, no matter how fast it could fly, to actually outrun its own bullets. After all, the speed of the average bullet is roughly around 1,700 mph. Mach 1, which Attridge had been traveling at, was 768 mph. That's nearly a 1,000-mph difference. Clearly, this proved the damage had to have been caused by something like birds or even small meteorites. And, yet, that theory was wrong.

The rounds Attridge fired while traveling at 768 mph left their cannons at approximately 2,000 miles per hour. However, immediately after being fired, they encountered enough air resistance to produce significant drag. This drag resulted in a greatly reduced forward velocity, causing their trajectory to curve downward—directly into the flight path of the aircraft from which they had been fired. As the bullets descended and their speeds decreased to about 400 mph, the Tiger also descended but with an increased speed of 880 mph. Just as he began to pull out of his descent, Attridge was struck three times. The first bullet pierced his nose cone, the second went through his windshield, and the final one directly struck his right engine intake. The time between him firing the first rounds and taking the hits was a mere 11 seconds.

The Navy considered the incident a one-in-a-million fluke and was certain it would never happen again. Attridge was less convinced, however. "At the speeds we're flying today," he later said, "it could be duplicated any time." He was right. In 1973, another Grumman test pilot, this one flying an F-14 Tomcat out in California, was struck by his own missile. Luckily, it was a dummy missile, and the pilot was able to eject to safety. More recently, in 2019, a Royal Netherlands Air Force F-16 accidentally shot itself from its 20mm rotary cannon. The pilot was able to land safely, uninjured.

These days, aircraft weapon systems are primarily missile-based, not just bullet-based. Whether they are short-range heat-seeking or long-range radar-guided, missiles have many clear advantages, such as their speed, which can easily exceed any bullet or aircraft. In fact, in order to prevent them from being damaged, missiles are specifically designed to be faster than the aircraft from which they are deployed. Thankfully, protocols are now in place to avoid self-collision, so hopefully no more pilots will take themselves down.

As for Attridge, while he would always be known as "the pilot who shot himself down," the incident cast little shadow on his career. He returned to service less than six months later and eventually went on to work on the Apollo Lunar Module. He flew west in 1997 at the age of 74.

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The Benefits Hidden in Learning to Fly

By Dan Sobczak (from Air facts Journal)

"It's clear that we're on the front end of something much larger than any of us can imagine, travels and adventures far greater than anything we can now picture."

While astronaut Ed Gibson of Skylab 4 was speaking of space flight when he made that statement, his quote could be applicable to any new endeavour in life. Learning to fly is no exception.

Learning to fly takes time, dedication and commitment. But the reward can serve you in life far beyond flying an airplane. You probably know the benefits of flight – speed, saving time, maximizing productivity – but have you considered the benefits of learning to fly?

Ben Franklin once wrote that "an investment in knowledge always pays the best interest."

When you learn to fly, you're not only learning how to move the controls of an aircraft. You're also learning more about the world around you.

When I was learning to fly, I learned how an airplane's engine and electrical systems work. I quickly realized this also taught me how my car operates. This serendipitous knowledge allowed me to become more self-reliant when it came to resolving car troubles.

I also learned about our planet's weather patterns. This foundation of weather knowledge gave me an advantage years later in my non-aviation career.

Just as important, I learned I was becoming part of something unique. The uniqueness wasn't the ability to fly, although that is pretty cool. Rather it was the people in aviation. They are a unique group: friendly, willing to help, and often share common interests beyond aviation. Learning to fly has produced lifelong friends I can trust for advice.

It's been said that life isn't about the destination. Rather, it's the journey that matters. When learning to fly, the destination is your private pilot certificate. While it can cost a considerable amount of time and money to learn to fly, what you're really paying for is an investment to create new experiences.

When you fly, you're not just logging flight time. You're also logging memories that will last a lifetime. Along the way, you'll likely discover and visit some new places of which you've never heard.

Picacho Pass, site of the westernmost Civil War battle, southern Arizona. Photo by Dan Sobczak

Once as a student pilot, my flight instructor and I took to the sky on a routine mission to practice aircraft manoeuvres southeast of Phoenix, Arizona. He told me to look down at the ground where I could see what remained of the Gila River War Relocation Center, an unfortunate injustice committed against Japanese Americans during World War II. I never knew that part of Arizona's history until that flight.

On another flight, I discovered the site of the westernmost battle of the American Civil War:

the Battle of Picacho Pass, 50 miles northwest of Tucson, Arizona. It was fought between a Union cavalry patrol from California and a party of Confederate pickets from Tucson in 1862.

Had it not been for aviation, I might never have learned about these nearly forgotten stories in American history.

In addition to learning more about the world around you and creating memories along the journey, learning to fly builds character. The process gives the student a sense of self and develops confidence.

A colleague once asked me why I fly. I fly for the sense of accomplishment. The ability to guide an airplane through the sky and return it safely to earth offers a sense of achievement that nothing else can match.

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The Year Santa Hired a Consultant

The hardest thing I've ever done in an aircraft

By O. C. Hope

This is a story I've told more than a few times, and some of you might even have heard it. In fact, a couple former F-16 pilots who became professional singers, called Dos Gringos, even wrote a song about it. Whether their song is about a similar experience of their own, this is what happened to me.

All that gear can make those "bio breaks" a little harder

On September 23, 1976, I was a senior Captain, Flight Commander, in the Air Force, recently returned from Southeast Asia flying the F-4D assigned to Hill AFB, Utah. The 366TFW at Holloman AFB, NM, had been tasked to deploy eight F-4Ds to Hahn AB, Germany, in support of the joint military exercise, Crested Cap. With six years-experience in the aircraft, I was ordered to augment this force and had been sent there with one of the back-seaters from my flight. As he figures unflatteringly in this story, let's just call him GIB (Guy in the Back).

After three hours of planning, briefing, preflight, start/taxiing, and marshalling, we launched from Holloman at 2330 local in two four-ship flights. I was flying as element lead (number three) in the first flight. Our route of flight would take us over Boston, across the North Atlantic to Scotland, then on to Hahn, with an ETA of approximately 1700 local. This is a long flight strapped into the ejection seat of a fighter. We were given "go" pills to take should we become drowsy enroute (most of the guys, me included, simply saved these to help keep us awake at the bar after arrival).

Because we were crossing the ocean, we had all been fitted with special protective clothing for some (limited) protection should we find ourselves in the water. In addition to our normal underwear, we first donned quilted thermal long john-style underwear, then a one-piece rubber "poopie suit" that sealed tightly at the wrists and ankles and zipped up the front, from either top or crotch with a water tight zipper. Over that we wore the standard nomex flight suit, nylon jacket, and flight boots. Before stepping to the aircraft, we added the parachute harness, which would be attached to the parachute and restraining harnesses of the ejection seat. Walking to the planes we resembled green pudgy dough boys carrying helmet bags.

The departure went fairly smoothly with an easy re-join into two flights of four in loose-route formation and clear, starry skies. We met up with two tankers, four on each stacked 500 ft. apart in trail (one following the other), and topped off our fuel tanks from them. We flew two aircraft on each of the tankers' wings from there along the rest of the stateside route.

As we approached the northeast part of the country, weather began to form at our altitude (mid-20s), forcing us all to fly closer and closer to keep sight. Contrary to the forecast of only scattered clouds, the visibility continued to drop to the point at which it was less than 20 ft. Now we were in very close formation, at night, in thick, lightly turbulent clouds, with light icing. I could see the wingtip light of the tanker but not the fuselage.

Here is where things got dicey—not because of the weather, but because I really needed to pee! I had been holding off, hoping for better weather where we could loosen up the formation and relax a bit, but that had been for the last hour and now I really needed to go.

Just with this contingency in mind, the Air Force has provided me with what they call a "piddle pack." This is a heavy, plastic bag containing a dried sponge with a neck opening of about 1.5" and an attached twist tie for closure when done. I had one of these in my lower left leg pocket and fished it out with my left (throttle) hand while I continued to fly formation with my right.

Here I should explain a couple things.

First, though I have flown several long deployments in the F-4 in the past, these were in the Southern Pacific and South China Sea and I had never had to use the piddle pack, nor had I worn the poopie suit.

Second, so far, I have said little about GIB. Most back-seaters, formally called Weapons System Operators (WSOs, pronounced "wizzo"), were extremely competent, fearless, and usually able to fly the plane from the back seat well enough to refuel if needed. Not the case with GIB. I had included him on this deployment with the idea that the experience would improve his performance. This proved to be one of the worst decisions of my career! Though I had given him considerable coaching and multiple tries at flying in the past four or so hours, he was completely unable to fly the plane on his own. The best I could get from him was movement of the throttles under my continuous instruction while I flew formation with my right hand, freeing up my left to get down to business. For those of you with no formation experience, conditions like these require that you hold position relative to the wingtip, looking away no more than two seconds at a time.

So, here we are sitting in a cold, dark cockpit, bouncing along in the weather, flying formation on nothing but the wingtip light of this KC-135, and I was going to try to pee into this small plastic bag using only my left hand while controlling the plane with my right, and while continuously directing GIB in the movement of the throttles.

When you're flying in tight formation, you can't take your eye of the wingtip for long

First, I lay the bag on the left console and begin digging through the multiple layers of protective clothing I was wearing. When I finally reached skin, I was confronted with another problematic reality. Like most fighter pilots I had a very large watch, but there wasn't enough hose to reach the garden! On top of that it was cold, and drawn up to keep warm.

Remember that song I mentioned earlier? It is titled "(Lord please give me a) 12-inch penis." Exactly how I was feeling at that moment! With the bag in my left hand and using the same hand to line things up in the dark, I was pretty certain I was going to soak my legs, the seat and floor of the cockpit. However, at this point the need and pain had become irrepressible and I just let go.

Relief! And to my utter amazement, I nearly filled the bag—pure luck.

I don't remember sealing and storing the bag, just the comfort of getting full control of the jet back.

The story can be ended here, but the adventure continues . . .

After going "feet wet" northeast of Boston and emerging from the weather, we were released from our initial tankers to set up for rendezvous with the next flight of five tankers. The F-4 had only an Inertial Navigation System (INS) and TACAN for navigation. We were to meet the tankers on a specific radial/DME about 100 miles east of the BOS TACAN. As we approached the designated mileage, there were no tankers in sight despite their claim that they were orbiting at that point. Studying my CDI, I realized that we were about five degrees south of the desired radial, putting us about 9 miles from the tankers. Looking north, sure enough my (then young) eyes spotted what looked like five faint stars in a row near the horizon, I notified Lead,

and the join-up was made on the trailing two tankers. Everyone cycled through another refueling for top-offs and confirmed good systems prior to getting much further from land.

Since emerging from the weather, I had noticed that the pitch control on my plane felt much more “touchy” than was normal. This was only a nuisance in loose formation, but when the precision of formation refueling became necessary, the challenge escalated. After working through the first refueling, I realized what the problem was. The F-4 has a bellows system designed to dampen the pitch response to control inputs as speed increase. This system was meant to help prevent over-Gs at high speed and used an airspeed probe located about halfway up the vertical stabilizer. This probe had an electric heater that was activated by the pitot heat system. Apparently, the probe heater had failed some time earlier in the flight, and was now iced up, resulting in the pitch control reverting to its most sensitive setting. Fortunately, I was able to continue to receiving fuel as we flew east.

For those unfamiliar with deployment refueling this is the way it works: each refueling point is based on the assumption that one or more of the receivers will not be able to take on fuel at that point and must have sufficient fuel remaining to divert to the designated alternate for that refueling point. Based on this rule, the further we were from landing points the more often we had to top off the fuel tanks. Over the middle of the Atlantic, we were almost refueling constantly. As we used up the fuel of the last two tankers, they dropped out and returned to home base while we moved up to the next two. The fifth tanker was there as a spare in case one of the others developed a problem. In an operation like this, there are also C-130 “Duckbut” aircraft assigned to orbit along at various points below our route to act as rescue support should a crew be forced to eject. I have not heard of anyone actually being rescued using this contingency, and considering the water temperature, was not very confident in the chances.

Sometime after sunrise, and just following our fifth refuelling, I was startled by illumination of the Master Caution light located just below the edge of the glare shield on the top portion of the instrument panel. A quick scan of the warning annunciator panel in the lower right corner of the cockpit revealed the Fuel Low caution light illuminated as well. Cancelling the Master Warning light (so it would re-illuminate should an additional malfunction occur), I paused to analyse the situation.

In the F-4, the engines receive fuel from a feed tank located behind the cockpits in the fuselage. It only contains a small amount of fuel, but is fed from the pressurized wing and drop tanks. The fuel low level sensor is located in this tank, and activates when this tank is no longer being refilled and its quantity starts to decrease. I obviously had fuel in all of my tanks, but the illumination of this light meant either a malfunction in the warning system, or a failure in the fuel transfer system.

Verifying that I had not left the refuelling door open (which depressurizes the tanks) and assuming the worst, I pushed up the power, announced the predicament, and requested an immediate hook up. In a few minutes I was again receiving fuel and the light went out. Though I waited near the boom, for a good while, it never came on again—just another little gremlin to keep me alert. My best guess is that because of the prolonged cold operation, the switch that activates the pressurization had stuck, and the repeated refueling freed it up again.

This is not easy, especially when the airplane is even more sensitive than usual

For the rest of the way to Germany I wanted to let GIB practice his airmanship, but we made little progress. He just really didn't seem to care to learn… and it turns out he never would. A few years later he washed out of Air Force pilot training.

We got our last top off approaching Scotland before the tankers dropped down to RAF Mildenhall for recovery, leaving us to continue on our own to Hahn AB where, of course, it was IFR with overcast skies. The clouds were high enough that we did not require a PAR approach (only precision approach option in an F-4) and proceeded to set up for sequential TACAN penetration—teardrop descents—and approaches. I was to be the third for landing. We were now eleven and a half hours into the flight. After rolling out on final approach, I broke out of the clouds near the FAF and lowered the gear and flap handles. Though I could feel the gear extending, this action was greeted with another Master Caution light accompanied by the Util Hyd Press annunciator light. "Aww Sh**!"

I had lost pressure in the hydraulic system that normally powers the gear, flaps, brakes, nose wheel steering, and backs up the primary flight control system. There are emergency backup systems to blow down the gear and flaps in this situation. Landing at this point was out of the question because it would necessitate lowering the tail hook and using the arresting cable to stop the plane. This would close the runway to further landings, putting the remainder of the flight in jeopardy.

I pushed up the power, initiating a go-around, declared an emergency, and explained the situation to all on frequency. Climbing back into the weather, we completed the checklists and held until the rest were safely down and clear of the runway. Again, I flew the penetration and approach, this time with the gear and flaps blown down and locked and the tail hook extended. The arresting cable was located at mid-field on the ~8,000 ft. runway. The hook caught on the first try and we came to a pretty quick stop, though the plane did slew sideways with no control over the nose wheel. Of course, we were greeted by fire trucks and blue cars, as we stiffly lifted ourselves from the seats. When we climbed down, I think someone even handed us beers!

I used my last swig to wash down the go pill and headed for the bar. 45 years and over 25,000 hours later, this was the most difficult flight I ever flew.

O. C. Hope
For nine years, O.C. flew all types of F-4s (except RFs), completing the Air Force Fighter Weapons Instructor Course at Nellis AFB in February of 1973. He has been a flight instructor of one type or another pretty much continually since that time. He transitioned to the AF Reserves and the F-105 at Hill AFB, Utah in 1978, and went to work as a pilot for Continental Airlines that same year. At Continental, he flew as Second Officer, First Officer, and Captain of the B-727, and Captain of the DC-9, A-300, and B-737. His last nine years before mandatory retirement were spent working as an Instructor, Check Airman and FAA Airline Pilot Designated Examiner for the Boeing 737. With retirement looming, O.C. completed his CFII & MEI, bought a couple planes and a couple simulators to kick off his third flying career as a GA instructor. Currently he is the Curator/Administrator of the Utah Aviation Hall of Fame.

—— ooOOoo ——

FLY-INS Looming

12 December 2021	Murgon (Angelfield) (ALA)	Burnett Flyers Breakfast Fly-in

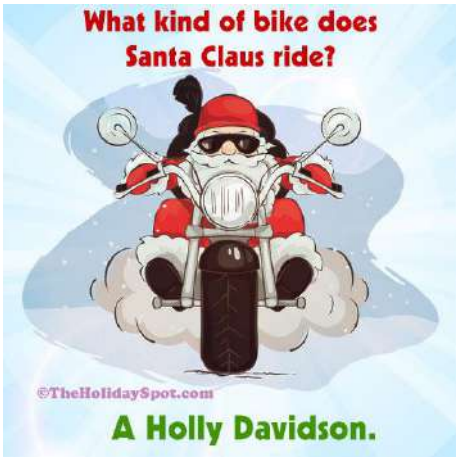
How did the ornament get addicted to Christmas?
He was hooked on trees his whole life

How much did Santa pay for his sleigh?
Nothing. It was on the house!

What do you call an elf wearing ear muffs?
Anything you want. He can't hear you!

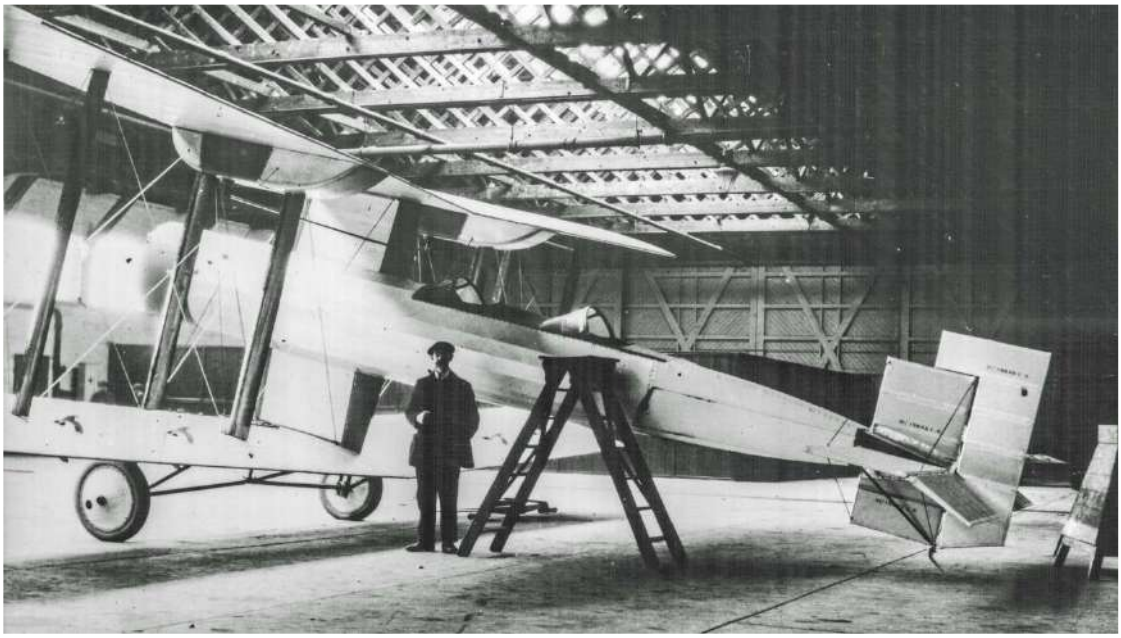
What did Adam say to his wife on Christmas?
It's finally Christmas, Eve!

Three men die in a car accident on Christmas Eve. They all find themselves at the Pearly Gates waiting to enter heaven. On entering they must present something relating to, or associated with, Christmas. The first man searches his pocket, and finds some mistletoe, so he is allowed in. The second man presents a cracker, so he is also allowed in. The third man pulls out a pair of stockings. Confused at this last gesture, St Peter asks, 'How do these represent Christmas?' Answer: 'They're Carol's.'



The Bristol 92 - Laboratory Aeroplane

An experimental aeroplane used to explore and investigate the drag and cooling issues of radial engines



The incomplete Bristol Type 92 Laboratory Biplane in September 1925.

The Bristol Type 92 was known as the 'Laboratory Biplane'. It was a two-seat two-bay biplane, designed by the Bristol Aeroplane Company to be flown with either a three foot or five-foot diameter circular-section fuselage, for the purpose of investigating the drag and cooling issues of air-cooled radial engines. These problems were largely resolved by the widespread adoption of the Townend Ring (or NACA cowling).

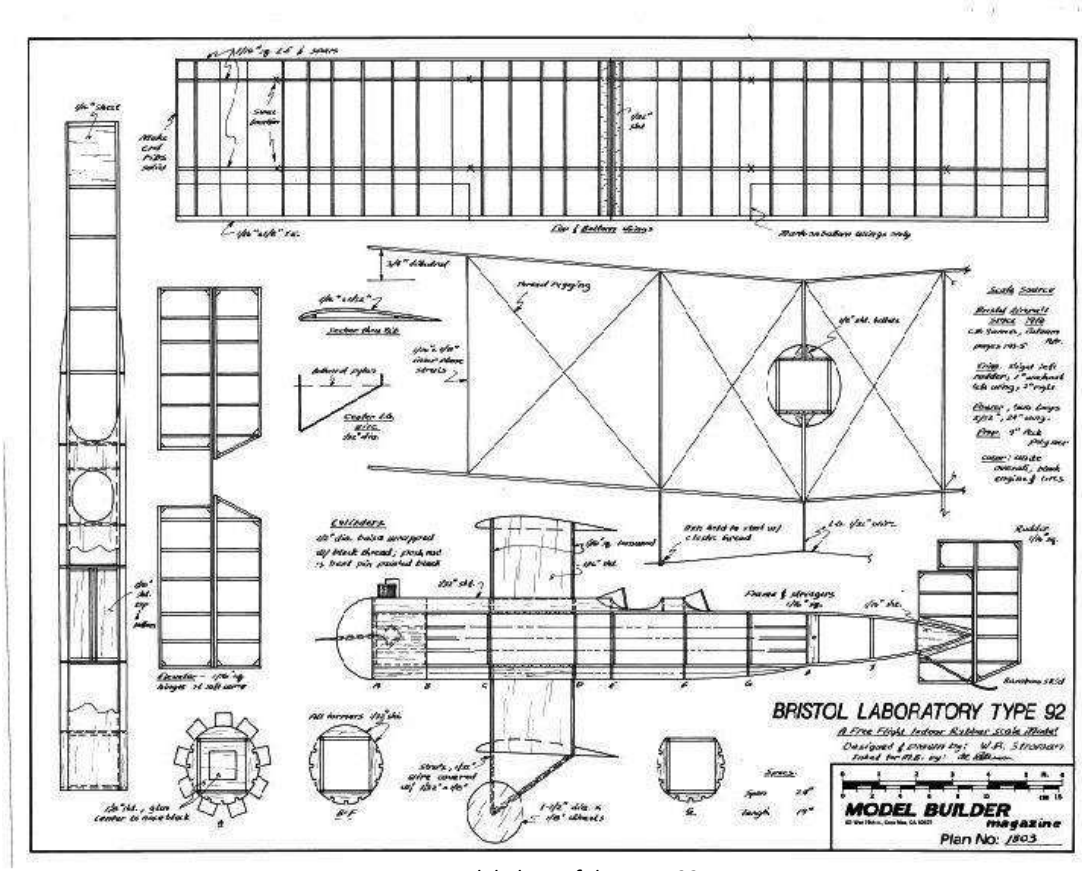
The aircraft featured a large wing gap of nine feet to minimize wing-fuselage interference, the position of the lower wing also resulting in a wide track undercarriage. The concept dated from 1923 but the sole aircraft to be built did not make its first flight until 13th November 1925.

The Bristol Laboratory Biplane with 3 ft diameter fuselage awaiting its Jupiter VI engine.

Trials at Filton continued for two years, mostly with the smaller diameter fuselage. No photos have been found of the completed aircraft in its flight configuration. The larger fuselage fairing was briefly fitted, but flying ceased following damage caused by a heavy landing.

Powerplant	One 450 hp Bristol Jupiter VI radial engine
Span	36 ft 0 in (11.125 metres)
Maximum Weight	3,400 lb ()1542 kg)
Capacity & Armament	Pilot and test observer
Maximum Speed	132 mph (115 knots)

Specs:



Model plans of the Type 92

Thanks to Mal McKenzie for this piece.

Jetson One - Personal eVTOL Now on Sale

By Russ Niles - October 23, 2021

Pilot's view from the Jetson One. (See YouTube, "Jetson One".)

A Swedish company has unabashedly adopted the pop culture name synonymous with flying cars and is now taking orders for what might be a viable personal eVTOL. The production model Jetson One was unveiled last week and the 12 ultralight and drone-like single-seat aircraft being built in 2022 have already been sold at the introductory price of $92,000. The company's brazen adoption of the name of the iconic space age cartoon family made popular in the 1960s is also reflected in its mission statement. "Our mission is to make flight available to everyone," the company said in its news release. "The Jetson ONE is an electric helicopter that you can own and fly. We intend to make everyone a pilot."

Jetson One in flight

The actual operation of the aircraft blurs the line between passenger and pilot, however. The occupant steers and decides how fast to go (up to a limit of about 50 knots) but the computer looks after mundane details like keeping it in the flight envelope and away from objects thanks to a suite of LiDAR (Light Detection and Ranging) sensors. Like a drone, the aircraft will automatically hands-free hover over a point. Endurance is about 20 minutes. Because it's an ultralight, no certificate is required. The Jetson has eight motors and rotors and can fly with one motor out. If things get more serious than that, a ballistic parachute is standard equipment. It comes as a 50 percent kit that has "detailed build instructions" but the company doesn't say how long it takes to complete.

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Keeping up with the Play

(Test yourself – how good are you, really?)

1. Which of the following aeroplane instruments require an aneroid capsule to function?
   A. The ASI.
   B. The Altimeter.
   C. The VSI.
   D. All of the above.

2. From the following, select the most correct statement.
   A. The altimeter is connected to both the static and the dynamic vents.
   B. The ASI subscale must always be set to the current QNH before flight.
   C. The VSI requires connection to the static vent only to operate correctly.
   D. The calibrated leak in the ASI must be clear for it to operate correctly.

3. Navigation lights fitted to aircraft come in only three colours, red, white and green. What coloured light should be fitted to the left, or port, wing tip?
   A. Red.
   B. White.
   C. Green.
   D. Blue.

4. Aerodynamic balance is manufactured into some aircraft control surfaces for which of the following listed purposes?
   A. To provide control “feel” for the pilot.
   B. To reduce pilot control load.
   C. To improve control; surface effectiveness.
   D. To reduce control surface hinge wear and improve longevity of that surface.

5. Operating under VMC in Class G airspace at less than 1000 feet AGL, how close horizontally to cloud are aircraft permitted to fly yet remain within the law?
   A. 1km.
   B. 1.5km.
   C. 3km.
   D. Clear of cloud (horizontally and vertically).

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. D is correct. All the instruments listed use an aneroid capsule to function.
   See: https://calaero.edu/what-is-pitot-static-system/

2. C is correct. Option A is incorrect because the altimeter is connected ONLY to the static vent. Option B is incorrect because ten hands maty be set to airfield elevation for local flights before departure AND QFE may be set where the airfield becomes the datum rather than sea level. Option D is incorrect because the ASI has no calibrated leak. ONLY the VSI has that.

3. A is correct. The left should be adorned with a RED light. White is always on the tail, so GREEN must be on the starboard wing tip.
   HINT: Mnemonic *"There's some **RED PORT** wine, **LEFT** in the bottle"*.

   - **Navigation Lights** - Navigation lights consist of a red light on the left/port wing tip, a green light on the right/starboard wing tip and a white light on the aircraft tail. Dual systems are often installed to provide redundancy in the event of a bulb failure. In aircraft equipped with a beacon, the navigation lights will normally burn steadily whereas in aircraft without a beacon, the navigation lights will flash.

4. B is correct. Aerodynamic balance is provided by a designer/manufacturer solely to reduce the control loads required of the pilot.
   See: https://encyclopedia2.thefreedictionary.com/aerodynamic+balance

5. B is correct. In Class G airspace, withing 1000 feet vertically of the surface, an aircraft operating in VMC must only remain clear of cloud.
   See https://vfrg.casa.gov.au/operations/general-information/visual-meteorological-conditions/

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Aircraft Books, Parts, and Tools etc.

Parts and Tools

Item	Condition	Price
VDO Volt Readout instrument	Brand New	**$70.00**
Altimeter. Simple – single hand	As new	**$50.00**
Oil Pressure indicator, (gauge and sender)	New – still in box	**$80.00**

Propeller Parts

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**

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

Altimeter for Sale

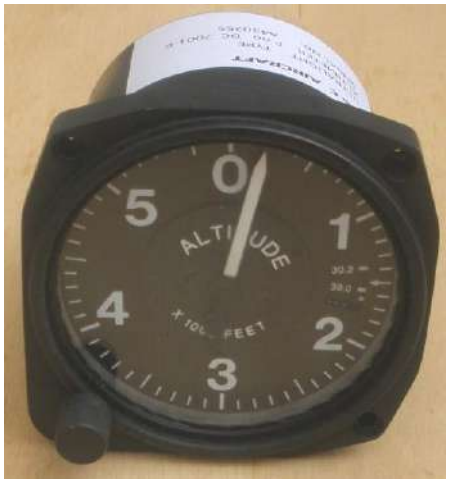
This simple altimeter I purchased at Oshkosh is now surplus to my requirements and I am seeking a new home for it.

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

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

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

Mob: **0419 758 125**



$120.00

Aircraft for Sale

¾ scale replica Spitfire **$55,000 neg**

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

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

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

Kev Walters on Tel. **0488540011** or

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

Aircraft for Sale

$ Make Me an Offer$

Cobham Cobra

An opportunity to buy a unique aircraft.

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

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

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

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

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

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

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

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

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

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

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

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

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

Aircraft Engine for Sale

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 call…..

Kev Walters on Tel. **0488540011**

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MERRY CHRISTMAS, AND HAVE A HAPPY NEW YEAR

See overleaf for the SPECIAL SUPPLEMENT

APPENDIX-1

SPECIAL SUPPLEMENT

POH for Santa's Sleigh's, Marks I and II

A.P. 2512A & B—P.N.

PILOT'S
AND
FLIGHT ENGINEER'S
NOTES

SLEIGH I & II

MARK I— EIGHT REINDEERS POWER PLANTS
MARK II— NINE REINDEERS POWER PLANTS

PREPARED BY DIRECTION OF THE MINISTER OF SUPPLY

A. C. Rowlands.

PROMULGATED BY ORDER OF THE AIR COUNCIL

J. H. Barnes.

RESTRICTED

AMENDMENTS

Amendment lists will be issued as necessary and will be gummed for affixing to the inside back cover of these notes.

Each amendment list will, where applicable, be accompanied by gummed slips for sticking in the appropriate places in the text.

Incorporation of an amendment list must be certified by inserting date of incorporation and initials below.

A.L. NO.	INITIALS	DATE	A.L. NO.	INITIALS	DATE
1	[illegible]	10/10/50	7		
2			8		
3			9		
4			10		
5			11		
6			12		

697

NOTES TO USERS

THIS publication is divided into six parts: Descriptive, Handling, Operating Data, Emergencies, Supplementary Notes for Flight Engineer, and Illustrations. Part I gives only a brief description of the controls with which the pilot should be acquainted.

These Notes are complementary to A.P. 2095 Pilot's Notes General and assume a thorough knowledge of its contents. All pilots and flight engineers should be in possession of a copy of A.P. 2095 (*see* A.M.O. A93/43).

Words in capital letters indicate the actual markings on the controls concerned.

Additional copies may be obtained by the Station Publications Officer by application on Form 294A, in duplicate, to Command headquarters for onward transmission to A.P.F.S., 81 Fulham Road, S.W.3 (*see* A.M.O. A1114/44). The number of this publication must be quoted in full—A.P. 2847A & B—P.N.

Comments and suggestions should be forwarded through the usual channels to the Air Ministry (D.T.F.).

SLEIGH I & II

LIST OF CONTENTS

PART I – DESCRIPTIVE

PART II – HANDLING

PART III EMERGENCIES

PART I
DESCRIPTIVE

INTRODUCTION

Santa Sleigh Mk.I and II are eight or nine engines transport aircraft, powered by magic reindeer engines. The Mk.II version allows extended all weather operations.

FUEL SYSTEM

Mk.I version is equipped with 8 fuel independent fuel tanks, connected each one to one engine. Particular care must be taken during refueling in order to guarantee equal tank filling for each engine. Not following this procedure can have catastrophic consequences including loss of engine during take-off or cruise and weight and balance problems.

AIRCRAFT CONTROL

The flying controls are conventional. Each rudder pedal may be adjusted for reach during flight by depressing the lever on the outboard side of it.

An automatic pilot is available. Heading entry is based on detection of ground beacons signal "I have been nice". For operation see A.P. 2095 Part III, Note C. The engaging lever is on the bottom left-hand face of the control pedestal, but before the gyropilot can be engaged the milk shut-off valve on the hydraulic control panel must be ON. The automatic pilot oil-pressure gauge is mounted on the lower right centre of the instrument panel; normal operating pressure is 120 lb./sq. in.

ENGINE CONTROLS

Engines are voice controlled. No automatic boost control is fitted and care must be taken to avoid over-boosting on take-off and at all times in flight.

PART II
HANDLING

Pre-flight checklist

1 – Reindeer Full
2 – Check weather report
3 – (Mk. II only) Rudolph's nose pre heating
4 – Inspect reindeer hooves
5 – Check loading done by Elves
6- Sleigh logbook and license on board and valid
7 – Kiss Mrs Claus good-bye

Starting the engines and warming up

1 – Pat on the back for each reindeer
2 – Check alignment of engines
3 – Call each reindeer by his name
4 – Give additional cookie and milk to reindeer during warming up.

Testing the engines and services

Particular attention should be paid to engines exhaust. Any suspect leaks must trigger the engine shutdown and replacement.

Take-off

Warning –If backfiring is experienced during the take-off run the take-off should, if possible, be abandoned and the air intake shutter examined for damage. To avoid backfiring, do not feed reindeer with beans.

(i) Align the Sleigh on the runway
(ii) There is little or no tendency to swing on take-off except in cross wind conditions. This tendency can

easily be corrected by slow differential power opening.

(iii) When comfortably airborne brake the legs and raise the arms

(iv) Safety speed at full load at full take-off power, flaps up is 105 M.P.H. I.A.S.

Climbing

The recommended climbing speed is 120 m.p.h. I.A.S. from ground level to operating height.

General Flying

Stability: The Sleigh is stable about all axes under all conditions of flight

Flying at reduced airspeeds in conditions of poor visibility: Reduce speed to 120 M.P.H. (104kt) I.A.S. in order to delegate navigation to Rudolph. Normal cruise speed can be restored one time control has been delegated.

Stalling

There is little warning of the approach of the stall except for a slight sleigh buffeting which may be felt some 5 m.p.h. before the stall itself. At the stall, the nose drops gently. In all cases recovery is straight-forward and easy.

Diving

Engaging the sleigh in a dive is forbidden under all circumstances. Exceeding the manoeuvering speed with the cargo load can have direct consequences on cargo wrapping and conditions. Children expect to hear reindeer's bells, not a Stuka diving horn.

Approach and landing

A particular attention should be paid to the last landing of the Christmas night. Weight and Balance are considerably modified and Sleigh handling can be tricky. Last turn before landing should not exceed 30 degrees and no sideslip must be done.

After Landing

Immediate cares must be given to the Reindeer. A particular attention should be paid to hooves. No Elves or ground support should touch them before:

(i) Grounding the Sleigh in order to avoid electrical sparks

(ii) Reindeer's hooves temperature is below 140 Fahrenheit.

PART III EMERGENCIES

Engine failure during take-off

Eight or nine engines configuration allows a minimum impact of one engine loss during take-off. Power boost can be applied by supplying additional cookies to remaining reindeers.

Engine failure in flight

In case of engine failure during flight, a particular attention must be given on the distance remaining and fuel consumption. During extreme weather condition and limited visibility, no automatic landing must be attempted without Rudolph (M.K. II only)

Cargo jettisoning

Cargo jettisoning can be attempted only above desert area or oceans. A particular attention must be paid to weight & balance during the procedure. Equivalent mass of Milk and Cookies must ingested by the pilot during the procedure in order to respect the CG envelop.

Ditching

Ditching speed must not exceed 105 M.P.H.
Reindeers power must be reduced to the minimum and all cargo must have been previously jettisoned. One time in the water, the Sleigh is designed to float and reindeers should provide necessary power to reach the closest land available

Parachute exits

Parachute exit can be done under 120kt I.A.S
The free fall position must take in consideration all interferences between the pilot's barb and the opening mechanism (See figure 1)

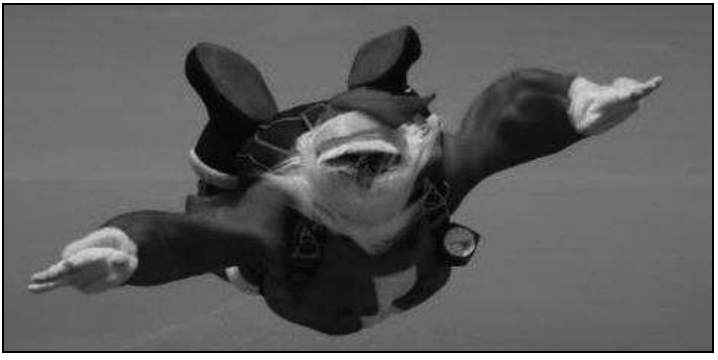
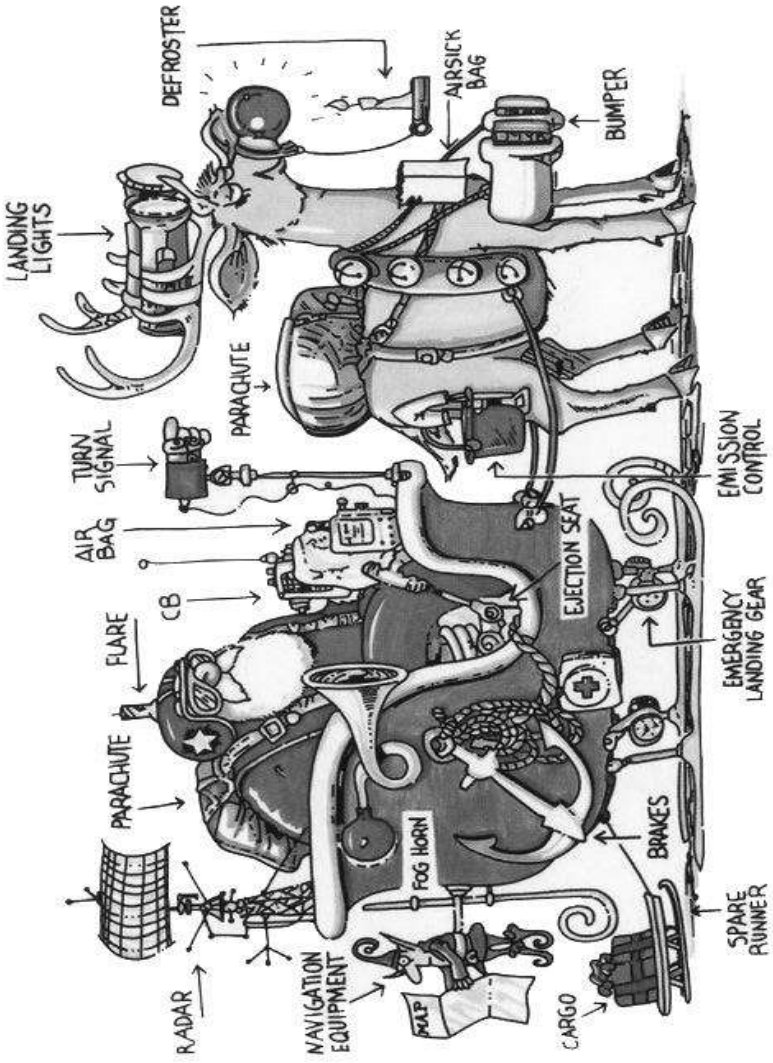


Figure 1: Parachute exit

ANNEXE I: DRAWINGS



ANNEXE II: ENGINES DATA

SLEIGH M.K. I

Eight reindeers:

- DASHER
- DANCER
- PRANCER
- VIXEN
- COMET
- CUPID
- DONNER
- BLITZEN

SLEIGH M.K.II

Nine reindeers: Identical to M.K.I. with additional RUDOLPH engine.

Figure 2: Engine Cutaway

(14318) Wt. 8233—1118 4m 6/47 G.S.St.