

KiwiFlyer™

Magazine of the New Zealand Aviation Community

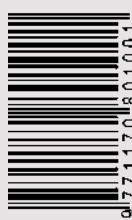
Issue 51 2017 #2

**Black Falcons Debut
Helicopter Fire Fighting
Airshow Galleries**

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From the Editor

There's a photographic feast in this issue of KiwiFlyer. Airshow enthusiasts have been spoiled for choice over the last couple of months. Sadly, weather prevented virtually all of the Wings Over Wairarapa show going ahead, but one week later the skies were blue for the RNZAF 80th Anniversary Air Tattoo at Ohakea. This was a great event with seven other Air Forces participating throughout the weekend. Around 30,000 attended and were treated to a fine array of static displays plus of course, continuous action in the air. Chris Gee wrote the report for KiwiFlyer readers which includes images from Chris, plus Gavin Conroy, Paul Le Roy, Geoff Soper, and even your Editor snuck one or two in as well.

Then at Easter it was time for the biennial Classic Fighters show at Omana. Once again, an excellent event, star of show this time being the radial powered Yak-3U with smoke generators on each wingtip. There's a gallery of images included within.

More poster worthy photos are included in the Diamond Nine article Gavin Conroy contributed after flying alongside the RNZAF Black Falcons when the team of five first paired up with four more to make a diamond nine formation.

A very public display of aerial fire-fighting ensued when wildfires erupted on the Port Hills near Christchurch in February. Jill McCaw spoke to several of those involved in the event and has thus provided an insightful article into the process and experiences of a difficult and tragic battle.

Another feature article for this issue is a report from Chris Gee on the Airbus A400M which visited New Zealand as part of the RNZAF celebrations and also as promotion for a potential Hercules replacement. Chris enjoyed a personal tour of the aircraft and interviewed the RAF pilots who brought it here and use the aircraft daily in their Air Force duties.

Amongst our regular pages in this issue, Grant Benns explains the square loop, something to do once circular ones become too easy. Then if you want to make hard harder, throw in some rolls, or rotate the whole thing 45 degrees into a diamond shape instead!

And that's another two-monthly dose of aviation enthusiasm spoken for. Wishing you good reading and safe flying.

Michael Norton

Editor | Publisher
KiwiFlyer Magazine



Features

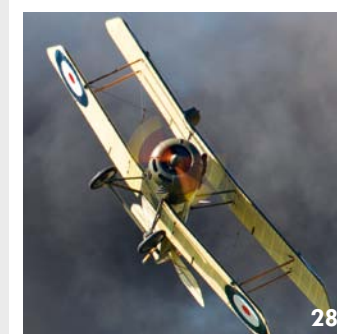
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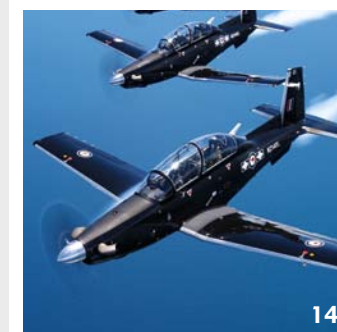
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The RNZAF Black Falcons in Diamond Nine formation. Gavin Conroy photograph.

About Us

KiwiFlyer is for and about the New Zealand Aviation Community.

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Aviation NZ Conference at Hamilton

The 2017 Aviation New Zealand Conference will be held at the Distinction in Hamilton on 24 and 25 July.

Themed 'Improving Performance' the conference is intended to give attendees insights and understanding so that individually and collectively, performance can be improved. The conference will also include a two day trade show and a gala awards dinner on 25 July when the industry will recognise its best and brightest.

Divisions of Aviation New Zealand will also hold conferences at the same time. These include the NZ Agricultural Aviation Association, NZ Helicopter Association, Supply Services and Engineering Division, Tourist Flight Operators and Training and Development. Some industry training days will also be held in Hamilton.

Agenda topics for the plenary include the Future Outlook for Aviation (Minister of Transport invited, Labour Transport spokesperson attending, and economist), Future Expectations of the Regulator, Fatigue Risk Management, Government as a purchaser of aviation services, Working on the business not in it, and more effective insurance cover. The plenary will also profile three world-class aviation technologies developed in New Zealand with global potential.

Delegates and exhibitors from Australia, Canada and the United States are expected to attend and it is hoped that representatives from ASEAN will also be there. AviationNZ Chief Executive John Nicholson says the conference provides an opportunity for the leaders of today and tomorrow to spend time together, gain knowledge and improve decision making so that the industry achieves its growth potential. Enquiries from trades exhibitors and sponsors are welcomed. Registration details and more information is available on the events page of www.aia.org.nz

KiwiFlyer will include a feature section previewing the conference in our next issue with special advertising rates for conference participants. email: michael@kiwiflyer.co.nz for details.

Diamond DA42 Twin for Air Hawkes Bay

Oceania Aviation have recently sourced and delivered a Diamond DA42 Twin Star for Air Hawkes Bay. Ex-Australia, the aircraft entered service in 2009 and was previously used for aerial surveying. As part of the acquisition, avionics

were upgraded, future proofing both Performance Based Navigation (PBN) and ADS-B surveillance requirement.

Air Hawke's Bay currently operate Piper Tomahawks, Cessna 152s and Glass Cockpit Cessna 172s, offering diverse training opportunities.

The four seat DA42 has two CD-135 engines and runs on Jet A-1, providing excellent fuel efficiency and cost effectiveness which has made the DA42 one of the most popular twin engine trainers worldwide.

CEO Kevin England says the new DA42 will enable students a smooth transition from instrument rating training on their C172. He adds the investment has also assisted in Air Hawke's Bay developing overseas flight training opportunities and has already started to generate specific MEIR interest.

Mt. Erebus Air Accident Memorial

Initiatives are being taken to plan for a national memorial for the 257 people who died in the 1979 Mt. Erebus air accident of Air New Zealand DC-10 ZK-NZP (Flight TE901). At present there is no public memorial to the Erebus accident where all 257 names are gathered together.

A voluntary advisory group, with Lady June Hillary as Patron, is advocating for the national memorial. Spokesperson and well-known aviation chaplain and historian, Rev. Dr Richard Waugh, proposes that the 40th anniversary in 2019 will be an appropriate time for the opening of a national memorial.

Dr Waugh says, "The Mt Erebus accident with 257 fatalities - 237 passengers and 20 crew - is New Zealand's worst civil disaster and still the worst aviation accident in the Southern Hemisphere – 18 more souls than the number that perished on MH370. New Zealand as a nation continues to be profoundly affected by the tragedy and it is a pastoral and public oversight that nothing has yet been done to establish a national memorial for the Mt. Erebus accident victims, especially for the many families involved."

The tragic accident on Mt. Erebus generated an air accident report, a Royal Commission of Inquiry, countless newspapers stories and articles, many books, and television documentaries.

Dr Waugh comments neither he nor advisory group members have any intention to refer to or discuss the cause(s) of the accident, and that no location for

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the national memorial or funding plan has yet been confirmed while extensive consultations are taking place, especially with the Government.

Dr Waugh and the advisory group are in discussion with many 'Erebus families', the Government (Ministry for Culture & Heritage) and other organisations, and are planning for a memorial on a similar scale and architectural appeal as the recently opened Canterbury Earthquake Victims Memorial. They are asking Erebus families and other interested people to register on the website (see details below) and to advocate for such a memorial by writing to Hon. Maggie Barry ONZM, Minister for Arts, Culture and Heritage, Private Bag 18041, Parliament Buildings, Wellington 6160. A copy to Erebus National Memorial Advisory Group, PO Box 82-363 Highland Park, Auckland 2143) would be appreciated. Detailed information at: www.erebusnationalmemorial.nz For more information please contact Rev. Dr. Richard Waugh by email: rjw@ecw.org.nz

Tecnam Founder dies aged 93

Founder and President of Tecnam Aircraft, Professore Luigi Pascale died unexpectedly on March 14 after a brief illness. Paolo Pascale, CEO and nephew of the Professore said, "It is with great sadness that we announce the passing of my uncle Prof. Luigi Pascale. He was incredibly proud of Tecnam and all of its employees, and we will all miss him greatly. His drive to excellence, determination, can-do spirit and commitment to our company will inspire and stay with us always."

Luigi "Gino" Pascale was 93 years old, native of Naples, Italy, whose passion for aviation began during the 1930s when with his brother Giovanni "Nino" they won many model plane races. The two brothers built their first aircraft, the P48 Astore, which flew in April of 1951.

At the time Professor Luigi had just graduated with a Masters Degree in Mechanical Engineering (the Department of Aeronautical Engineering was created later by the Professor himself) and started his career at the University of Naples as assistant of Professor Nobile. Umberto Nobile was also an outstanding aviation character, undertaking the first expedition to North Pole with an airship.

Gaining his Pilot's Licence in 1951, Professor Pascale designed and built a number of competition winning 'race' planes including the P55 Tornado.

Founding Partenavia in 1957 he began building General Aviation planes 'for everyone'. Aircraft such as the P64 Oscar and P66 became favourites as training aircraft and led to his innovative P68 light twin design.

In 1986 the two Pascale brothers founded Tecnam, and Professor Pascale's first design, the P92 has now flown 200,000 hours with over 2,500 in service worldwide. His last design, the Tecnam P2012 Traveller is intended to transform regional commercial aviation and is currently being flight tested. With Partenavia and Tecnam more than 7000 aircraft have been delivered worldwide.

Professor Pascale has received numerous accolades and awards including the 'Paul Tissandier diploma' from Federation Aeronautique Internationale, the 'Aeroplano d'Argento' and the 'Flieger Magazin' Award. Last year Seconda Università di Naples (SUN) conferred on Professor Luigi Pascale, its highest accolade, an Honorary Doctorate in Aerospace Engineering. He leaves behind an outstanding worldwide legacy to General and Recreational aviation.

TAIC recommends internal ELT antennae

Once again, a Transport Accident Investigation Commission report into a fatal helicopter accident (this time for Robinson R44 ZK-HBQ in October 2014) has referred to the lack of an ELT signal delaying the discovery of the wreckage and the recovery of the pilot. In this case, More than 80 hours of helicopter flying were required to find the accident site, along with many hours of ground searching over three days.

TAIC specifically say that a more crashworthy ELT, or an ELT with an integral antenna, would have likely reduced the time required to find the site. TAIC stated that the position reports from the flight tracking unit fitted to the helicopter greatly reduced the size of the initial search area, while also observing that not all aircraft are fitted with tracking devices, and their effectiveness depends on the selected interval between position reports, the surrounding terrain, satellite positions and the installation of the units.

Helicopter owners in particular, should take this on board when next contemplating any work requirements on their avionic systems – or simply consider upgrading regardless.

One available ELT system with an internal GPS and 406MHz back-up antenna is the Kannad Integra 406 GPS ELT. Kannad promote the GPS capability as reducing typical search areas from 28 to just 0.03 square miles. The unit's integral internal antenna transmits ID and GPS location – even if the crew remove it from the aircraft. The design is such that retrofitting or new installations are economically accomplished. More information is available from Lloyd Klee at Aviation Safety Supplies: 07 543 0075, integra@aviationsafety.co.nz or www.aviationsafety.co.nz

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Helispecs welcomes Tim Gardiner to the Team

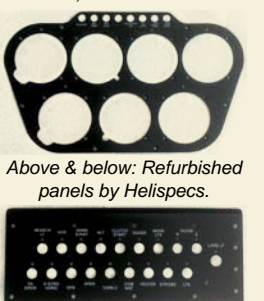
Tim takes over the role vacated last year by David Dennerly whom Helispecs Director Roger Maisey wishes all the best to for his new venture.

Tim brings with him extensive rotorcraft experience and full licence coverage for group one and two rotorcraft, as well as piston and turbine engines. With Roger having recently attending the Robinson R22, R44 and R66 Maintenance Course at Robinson Helicopters in California, Roger is fully conversant with all the latest requirements for Robinson Helicopter maintenance, overhaul and operations.

Being a Robinson Service Centre, Helispecs is well placed to meet Robinson Helicopter owners' requirements from maintenance, 2200hr / 12 year overhaul, to parts supply and refurbishment. Helispecs can carry out full interior and exterior refurbishment including refurbishment and screen printing instrument consoles and panels back to as new condition. Of course these services are not confined to Robinson Helicopters with all major brands catered for at their Taupo facility. Helispecs also provides in-house services for bi-annual avionics and ELT checks.



L-R: Roger Maisey, Shawna Keehan, and Tim Gardiner.



Above & below: Refurbished panels by Helispecs.

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Christchurch Fire Fighting

Five of the nineteen helicopters that were employed to fight the Port Hills fires near Christchurch during February.

Firefighting is a big part of the summer workload of New Zealand helicopter companies. In February 2017, when wildfires encroached on the populated outskirts of Christchurch, helicopter pilots and crews raced to answer the call, some, with no time to catch their breath, straight from fighting large fires in Hawke's Bay. It was a country-wide response with aircraft from Hawke's Bay, Tekapo, South Otago and Oamaru scrambling to help. In all, there were 19 helicopters involved, plus fixed wing aircraft and while they were not all flying at once, there were occasions with 17 helicopters active at one time.

The aerial ballet happening above the fire seemed incredible and heroic. It is not however unprecedented. There were similar levels of aircraft involved in the Blenheim fires in 2015, and at other large fires over the years. It's just that those ones weren't in full view of a major city.

Still, it was an incredible turn-out of working aircraft; pilots precision flying for long hours in close proximity to each other,

the ground, wires and other hazards. To those of us watching in awe from the ground they seemed like true heroes, saving lives and property at a level that seemed well above the norm. And the tragic death of pilot Steve Askin proved just how dangerous it can be bucketing water onto a fire.

Sitting on the ground in Christchurch and watching the fires roar across the hills was terrifying. Picture a tree break of mature pine trees. Hold the thought of their height in your mind. Then imagine flames, shooting high above them, twice as high again, and that fire is racing across the ground, consuming everything in its path. It's right on the outskirts of your city, one wind change away from the homes of your friends, conceivably within reach of your home. It is a scene straight out of an apocalyptic screen play. Into that tumultuous sky come the helicopters, buckets trailing. They're heading out over the fire, dumping water, coming back to refill, doing it again, and again, and again, from dawn to dark. The fire is slowly beaten back. No wonder people see the helicopter guys as heroes. They stopped the fire.

Except that they didn't. Everyone I spoke to when writing this

was quick to point out that helicopters do not put out fires. Dropping water from the air dampens a fire and allows the ground teams to get in and put it out. The air offensive is in support of the ground teams. They're the ones down in harm's way, in the heat, doing the hard work. The helicopter guys want you to know that. They're self-deprecating and humble; they're just doing what they do.

The helicopter work was still extraordinary.

On about day four I watched the monsoon bucket filling operation at a duck pond in the Halswell Quarry Park. The park had suddenly become one of the most active airfields in the country. The operation ran like a conveyor belt with a helicopter hovering, dipping to fill its bucket, way below on the end of a strop, lifting off and disappearing over the ridge, only to reappear less than ten minutes later to refill and do it again. There were at least six helicopters working during the time I was observing, heading out and coming back to refill on a great rotating circuit. Their approach was over power lines and trees and frequently there would be three of them simultaneously refilling from the (not terribly large) pond. No-one was flying with a spotter. The pilots' work load would have been immense. It occurred to me that my observation point was not a particularly safe place to be.

How it worked and what it was like

Tim Murdoch, Christchurch Helicopters' ground crew at Halswell Quarry, told me that as well as having a sling rating, the only legal requirement

for using the bucket, Christchurch Helicopters' pilots all train with the Selwyn District Council fire crews to learn how to respond, both on the ground and in the air in a fire situation. Most helicopter pilots around the country do likewise.

Up above all the bucketing activity, orchestrating it all was Paul Devlin, Air Attack Supervisor (AAS). The AAS' role, Paul told me later, is to manage the aircraft tactics from an aerial platform above the fire ground. An AAS is called in any time the number of aircraft involved in a fire fighting operation exceeds three. As a Christchurch City Council Ranger, Paul has built up skills in Air Attack, from early days in the late '80s, working with helicopters for Search and Rescue at Mt Cook. Paul has done this work here and overseas. He's been learning and refining the role since its inception during a busy fire season in 1993 and is now involved in training others. He has also used his skills recently in a non-fire situation; managing the aircraft involved during the response and recovery work in Kaikoura.

In the back of his mind he keeps the acronym, S.E.E.L., Safe, Efficient, Effective, Logistics. The idea is, he says, to co-ordinate the aircraft, to have the right machines doing the right job, to co-ordinate with the ground staff and constantly work on making sure that the work is effective. Safety is paramount.

Paul is not a pilot himself, although he says he's picked up a fair bit over the years. He can read the instruments at least. His pilot for most of this campaign was Christchurch Helicopters' Rob Hunt.

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Christchurch Fire Fighting

Director of Christchurch Helicopters, Terry Murdoch flew Air Attack the first day and Dougal Monk on other occasions. All three are experienced bucket pilots. Rob and Paul have flown together quite a bit over the years and work as a team. Rob is able to provide invaluable insights into how helicopters handle and what they're capable of doing. Because they're not flying with a bucket, Rob could take the helicopter into tighter places and move to see things anywhere over the fire ground. They often played 'bird dog,' leading the planes with retardant through the fire.

Rob says, the first flight of the day is a 'reccy', looking for hot spots and working out strategy for the start of the day. The last flight is always about checking that everyone is off the fire ground. They usually fly a high, large, left hand circuit so that Paul can see everything. With this fire, the ground was broken into four sectors, for ease of identifying areas on the ground. There were three clusters of helicopters. Each cluster had a senior pilot leading the group and generally all instructions were passed through that person. Paul had three radios going. Fire Four was the tactical frequency which he used to communicate with the ground and the pilots. The other two radios provided a listening watch, monitoring circuit calls (into and out of landing areas and ponds or bucket fill areas) and the pilot's air to air chatter.

Keeping an ear out for tone, more than what pilots were actually saying, was important for helping Paul manage the pilots' work load. "No one wanted to lose someone's home. They all took it personally. But sometimes they were pushing a little hard and we needed to 're-set'. When I heard that urgency building I'd get people to back off a little, suggest they fly a little slower, that sort of thing. I always modulated my voice, lowered the tone." After Steve Askin's accident Paul ordered everyone on to the ground and then took the time to talk to every pilot individually, checking how they were doing. He gave everyone the option to go home, assuring them that no one would think badly of them, but they all re-engaged. Within 45 minutes everyone was back in the air. "It spoke volumes of their professionalism and their desire to serve their community," Paul says.

The Adventure Park area was a real problem. Rob Hunt said, "It was like a bird cage in there." There were high tension power wires across the valley and then the chair lift cables and zip lines actually hidden in the trees. Not to mention, the approach had wind on the tail and was towards rising ground. Alan Beck of Beck Helicopters reckons that flying around the Adventure Park was the trickiest flying he'd ever done. Paul was ready to shut that action down at any time. "My job," he says, "is not to let the situation over ride safety. I'm the one who says, 'It's okay. Stop fighting that.' No one wants to be the first to say that a situation is too hard, but often, once you pull them out, you'll hear people saying, 'Yeah, that was getting really gnarly in there.'"

Finding water was a challenge. There were few good ponds on the hills and water was collected from the harbour, swimming pools, stock ponds and supplemented by dipping dams and even from the backs of trucks, refilled by ground crews. "Once we'd finished evacuating people on the first day," Rob Hunt says, "I was liaising with the tower and told them we needed an extension of the area [given to us to fly in] as all the helicopters were spreading out and looking for water sources that we could use." A good water source was fiercely protected and good sources with good access, such as some swimming pools next to homes high on the hills, were kept refilled from local hydrants. Arguably, some houses were saved because their pool was a water source that needed to be protected.



5 AS350s, an EC120 and a BK117 at the end of a hard day's work.



Christchurch Helicopters team members discussing tactics.



High tension power lines and hidden chair lift cables made for treacherous flying.



Otago Airspread's Cresco drops fire retardant.



Terry Murdoch fills the Twin Squirrel's bucket for another round trip.

Paul was liaising with ground crews who would call in requests for water over an area. A long experience in this sort of situation helped him prioritise those calls, at the same time as making sure that areas that needed it were being bombarded with water with as little pause between drops as possible. He liked to have helicopters coming into an area in continuous rotation. Different pilot's skill levels needed to be taken into consideration and with pilots flying from first light until dark, fatigue could be a problem and pilots were expected to take themselves out if needed.

On day three, the situation got personal for Paul Devlin. As Head Ranger for the Port Hills he lives in Victoria Park, and Victoria Park was under threat. Paul says he couldn't let that affect him. His staff helped his family evacuate. "My family were safe and nothing else mattered. You have to make the call on what you can and what you can't protect. On Wednesday, we knew we were going to get a hiding. On Tuesday, we'd lost Steve and we couldn't forget him but we had to put that to the back of our minds. We knew we'd be really struggling to contain the fire. We had to make the call to let Victoria Park go and concentrate on the privately owned houses on Worsleys' Spur." In the end, the upper areas of the park did burn, but Paul's house and the area around the visitor centre and Ranger HQ survived.

On Thursday, they finally started to get some 'hard edges' to the fire and box it in. "Chasing the flames is very ineffective," Paul says. "You risk splitting the head of the fire." By then the fixed wing aircraft were involved and dropping loads of fire retardant. Which added new challenges. "You've got the rotary aircraft flying at around 60 knots and the fixed wings doing 120 knots. It's a real aerial ballet." The fixed wing aircraft were laying retardant in high crosswinds. Added to that, Paul says that once the fire retardant is dropped ahead of the fire, you can't put water on it. This made the ground crews very important. "But everything we do," Paul said, "is directed to the ground crews and what they need on the ground. The water from the helicopters takes out some of the energy and it might nudge the fire around, take out the main heat. Then the ground crews come in and take it out. There aren't many fires that don't need the poor sods on the grubbers. Every bucket counts for them. And, they're on the ground for two weeks after the helicopters are done."

All the pilots are highly skilled and know their job. They've all trained with the local fire authorities and know what fire does, Paul explained. "You're seeing professionalism at work." There are new pilots coming through, learning the ropes of fire fighting and new people learning the Ops roles too. People backseat with Paul and he backseats with people who are new to the role. After years of people having to go overseas to learn the skills there is now the NZ Standard Aircraft Management of Wildfires course available. "The training is strongly focussed on leadership decision making in a complex environment with less than 100% of information available," Paul says. "People either fail or excel."

By the weekend the choppers were still bucketing water onto hotspots but the fire was essentially under control. With the situation slowing down the pilots could begin to process the thought that they had lost one of the team. "Everyone is so sorry about Steve," Rob Hunt said. "Make sure you say that." Christchurch people were rallying to start working out what they'd lost in this disaster and get on with cleaning up. Mostly though, Christchurch was safe.

I visited Paul, three weeks later, back in his day job in Victoria Park when he was planning the clearing and replanting of the damaged areas of the Port Hills. "It is very rewarding," he said, "when you have a good day."



Peace of Mind at Insurance Claim Time

Unless you are violating the terms of your policy, there should be no need for sleepless nights if the time comes for an insurance claim. Bill Beard from Avsure explains as follows:

I have occasionally been party to a conversation wherein an aircraft owner will vent his opinion fairly strongly that Aviation Insurers would do whatever they could to avoid paying claims. I deal with insurance companies every day of the week and you may be interested to know that the underwriting staff of the majority of companies are very knowledgeable in aviation matters, either being long standing aviation enthusiasts or pilots, and in some cases even aircraft owners themselves.

Having been involved in the aviation insurance industry for over 30 years, I've only come across a few insurance claims that were justifiably denied. However, over this time I cannot recall seeing even one claim being declined for what I would consider questionable reasons.

I can assure you that aviation insurers

would only consider declining a claim if there is a clear violation of the policy terms and conditions and that the violation is directly related to the cause of the accident that resulted in the claim.

Claim settlements are the insurance industry's 'shop window'. Companies will not risk legal action as a result of declining a claim on non-related grounds. On the other hand, I would expect an insurance company to deny a claim if the pilot was either not named as an approved pilot or did not meet the pilot qualifications or minimum experience levels under an open pilot warranty. Likewise you could expect problems if at the time of an accident, the aircraft was being used for something other than the approved uses under the policy.

The best way to avoid problems in this area is to make sure your policy is correctly issued. I suggest you check it right now to ensure the uses adequately meet your requirements, bearing in mind that standard uses do not include (amongst other more hazardous activities) instruction, private hire/rental, aerobatics, patrols, experimental or competition

flying or air races unless specifically mentioned in the schedule.

Ensure all pilots that fly your aircraft are named or meet any restrictions imposed under the policy. Ensure the correct pilot information, with regard to experience and hours on type are accurately recorded with the underwriting company. Bear in mind that known CAA violations relating to any pilot should be notified and updated every renewal. It is important to keep in mind that it is a policy condition that you must comply with all CAA rules with regard to the operation of your aircraft.

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T-6C Texan II specs at a glance:

Manufacturer: Beechcraft
 Power Plant: PWC PT6A-68 (1100 shp)
 Length: 10.16 m
 Wingspan: 10.19 m
 Propeller: 4 bladed Hartzell
 Gross weight: 6,300 lb
 Cruise speed: 278 kts
 Max speed: 316 kts
 Max range: 1,667 km

A New Display Team

In mid-2015 it was reported that a new aerobatic team would be formed using the Texan II. Neither the number of aircraft in the team nor the team name had been decided however.

An initiative via social media saw members of the public put forward their suggested names for the team. In the end the 'Black Falcons' name was chosen - familiar to some as also being the name used by an RNZAF aerobatic team flying Aermacchis in the 1990s.

Five aircraft would form the team which would be made up of Instructors from the Central Flying School and 14 Squadron.

Entry to the team is voluntary, other selection requirements being a necessary skill level and the ability to fit in as part of a tight group that will spend a lot of time together. Work-up for the team is carried out in the mornings before normal training begins, or at lunch times so as to not interrupt scheduled training flights that occur throughout a day.

The 2016-17 Black Falcons team are:
 BF 1: SQNLDR Brett Clayton. CFS
 BF 2: FLTLT Dan Pezaro. 14 SQN
 BF 3: FLTLT Stu Anderson. CFS
 BF 4: SQNLDR Hayden Sheard. CFS
 BF 5: SQNLDR Sean Perrett. CFS
 BF 6: FLTLT Mike Williams. CFS
 BF 7: W/O Ash Wilson. CFS
 Essentially the structure is that BF1-5 display, BF6 ferries spare aircraft / admin support and BF7 is Team Manager.

Planning a photo flight

Once the Texan IIs had started arriving in New Zealand I began to wonder about a possible photo flight with one or two of these aircraft once they were in service.

In December 2015 I met up with Sean Perrett following a photo flight we had completed with Spitfire PV270. At the time we looked at several options but decided to hold off until the Black Falcons



Diamond Nine

contributed by Gavin Conroy

The Black Falcons plus four more of the RNZAF's eleven T-6C Texan IIs in a Diamond Nine formation off the coast of Ohakea.

The RNZAF Black Falcons performed their debut display over Ohakea at the RNZAF 80th Anniversary Tattoo late in February. There are five flying members in the 2017 team, however back in December a first opportunity to bring together a nine ship formation was created. The results, as told by these images, were outstanding. In the following, Gavin Conroy covers the background to the new team's formation, plus the lead up and execution of quite a special day of flying. Gavin writes:

At Warbirds Over Wanaka 2012 a USA based Beechcraft T-6C Texan II demonstrator flew some great displays and showed the way of the future in regards to advanced training aircraft for service in the military.

During its time in New Zealand several RNZAF pilots flew in the Texan II with many convinced that it would be an ideal trainer to replace the PAC CT-4E Airtrainer.

The CT-4B/CT-4E Airtrainers had

served with the RNZAF for decades but with existing aircraft (such as the Hercules, Boeing 757 and Orion), and all new aircraft arriving (such as the NH90 and A109) having glass cockpits, plus all aircraft in the RNZAF now powered by turbo-prop or jet engines, the time was right to consider a modern advanced trainer to replace the piston powered and analogue cockpit Airtrainers. Another advantage of the Texan II was its full IFR capability, helping it to fit well alongside

the King Airs and their role in training transport pilots.

The field of contenders was narrowed down over time and as we know, the Texan II was the eventual winner. Eleven were purchased to replace the CT-4E.

In addition to purchasing these aircraft, another exciting development was the revival of 14 Squadron which has a proud history with the RNZAF. The Texans would be operated by this Squadron and utilised by the Central Flying School.

Arrival

The first two Texans arrived at Ohakea following ferry flights from the USA in August 2014 with the rest arriving over the next few months.

During 2015 instructors from the Central Flying School were trained on type, a process made simpler for them and their students to follow, thanks to a fully functioning simulator - helping ensure instructors and students gain maximum value from actual airtime during training.

team had been trained up.

That photo flight of the Spitfire saw Brendon Deere's Avenger used as camera plane, which was ideal as we could photograph the Spitfire head on through a perspex cut out where the ventral gun was once fitted. After seeing the photos from that day, we agreed how good it would be to use the Avenger again for the Black Falcons if such a flight became a possibility.

Then in October 2016 discussions started again. I was asked by SQNLD Jim Rankin if I would like to photograph the team using the Avenger. The answer to that

question was a no brainer!

We thus planned for a Black Falcons photo flight after the forthcoming Navy's 75th Anniversary celebrations. For that occasion nine Texans were to be brought together with pilots trained up to fly a "Diamond Nine" - a fantastic idea.

As it turned out I was invited aboard an RNZAF NH90 helicopter for this event, the intention being to hover near Devonport whilst a stream of aircraft flew over the warships docked at the waterfront. I was especially keen to get a good photo of the nine, actually it was my main priority

during that flight.

Unfortunately, the weather interfered and the flight was scrubbed. It was a huge disappointment to thousands of people but the weather really was terrible.

Heading back home, I wondered that since a nine ship team had done the lead-up work but not been photographed, we should look to get all nine together again as part of our planned Black Falcons images. Jim thought that was a great idea and put the suggestion forward for approval which we gratefully received. We had gone from talking about the possibility of one or two aircraft in late 2015, to planning for nine, and fly-day was coming soon!

Making it happen

The logistics for a flight like this is huge. We needed nine serviceable aircraft and pilots. We needed engineers and flight line staff. Air traffic control was heavily involved and several other people gave up their day to make the flight possible.

We had just one date when everyone could be there and it was December 5th. After that we didn't know if or when it would be possible to bring all the key people and aircraft together again.

I flew up to Palmerston North on the morning of the 5th only to find it raining on arrival. Cancelling photo flights due to weather is just the way it goes sometimes, but so much work had gone into this flight that everyone really wanted it to happen. There were some quite disappointed pilots wandering around.

In any case, we conducted a pilot brief which covered off every eventuality as well as the profiles we would fly. Then right on cue the weather started to clear.

Falcon 1 Brett Clayton would make the various formations happen. As well as my list, Brett added in others which was great as I wasn't aware of the detail of earlier practice sessions.

What essentially happens is that the Black Falcons arrive in a five ship Vic formation behind the camera plane. Then the other four aircraft arrive in a Box 4 behind the Vic and form up accordingly - which we thought would take a while to get together but the guys made it happen quickly.

The next 10-15 minutes were unbelievable with everyone staying in perfect formation. I was keen to get some puffy clouds and blue sky in the background and for that we ended up needing to go to 10,000 feet, a lot higher than we would normally. Once there

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though, the air was amazingly smooth. But don't think that takes any complexity away from what was going on; these guys were on top of their game. Base Commander GP CAPT Nick Olney made mention before we took off that it might be the only time an air to air flight like this of all nine aircraft happens - so make the most of it, and they were!

Nick flew in the Avenger on the day. It was flown by Jim Rankin, and as a way to say thanks, the Avenger's owner Brendon Deere was invited to fly in the Lead Texan.

We flew one orbit more than was planned with the nine. It was going so well that I didn't want to let them go but when I had enough I let Falcon 1 know and he instructed the Box 4 to ease out and depart back to Ohakea.

Over the next 30 minutes, we flew several different formations such as Vic, Concorde, Kite, Echelon, and Luna. I was able to move the formation around using hand signals, and could call when we wanted smoke on or off which made for a lot of different variations and avoid photographing the same angle throughout the flight. Once that part was completed we made a quick descent in Echelon formation, then moved back into Vic for two passes down the runway before breaking to land.

As the photos show, in the end everything came together very well. The Black Falcons have of course gone on to fly fantastic displays at various events around the country over the summer months and will no doubt continue to thrill airshow crowds in New Zealand for years to come.

Sincere thanks are due to everyone who made the flight possible, with special mentions to Nick Olney, Jim Rankin, Sean Perrett, Brett Clayton, and Brendon Deere.

Gravin Conroy



The Diamond Nine were:

- | | | |
|----------|--------|---|
| Falcon 1 | NZ1401 | SQNLDR Brett Clayton & Brendon Deere |
| Falcon 2 | NZ1402 | FLTLT Dan Pezaro & SQNLDR Dicko Beaton |
| Falcon 3 | NZ1403 | FLTLT Stu Anderson |
| Falcon 4 | NZ1404 | SQNLDR Hayden Sheard |
| Falcon 5 | NZ1409 | SQNLDR Sean Perrett |
| Silver 1 | NZ1405 | SQNLDR Anthony Budd & FLTLT Jimmy Peters |
| Silver 2 | NZ1407 | SQNLDR Gareth Russell & FLTLT Axel Joel ^(RAAF) |
| Silver 3 | NZ1408 | FLTLT Wal Thompson & FLTLT Matt Hansen |
| Silver 4 | NZ1410 | SQNLDR Paul Stockley & FLTLT Micko Shaw |



L to R: SQNLDR Hayden Sheard, FLTLT Dan Pezaro, SQNLDR Brett Clayton, FLTLT Stu Anderson, SQNLDR Sean Perrett.

1. Overhead Ohakea. 2. Conchord formation. 3. Kite formation. 4. Vic formation.



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Global Pilot Shortage calls for New Pilot Trainees

Will a career as an airline pilot be THE career to have in the next two decades?

Demand, driven by the increased global appetite for airline travel, new aircraft coming on stream, pilot retirements, regulatory changes regarding increasing pilot proficiency, and the opening up of new routes, has led to what Boeing calls an 'extraordinary' demand for new aviation personnel.

Airbus and Boeing echo the same message as they publicise their forecasts for pilots required over the next 20 years.

In their 2016 'Pilot and Technician Outlook' to year 2035, Boeing predicts, "the aviation industry will need to supply more than two million new aviation personnel - 617,000 commercial airline pilots, 679,000 maintenance technicians, and 814,000 cabin crew". (<http://www.boeing.com/commercial/market/long-term-market/pilot-and-technician-outlook/>) The largest growth is forecast for the Asia Pacific region with a predicted requirement for 248,000 pilots by 2035.

Massey University School of Aviation therefore believes that now is the perfect time for aspiring pilots to embark on their training to become a professional pilot.

Advances in Massey's flight training methodologies that complement their technologically advanced fleet, ensure that students are presented with the best New Zealand has to offer and which reflect current airline practices – a professional aviation degree that integrates university study with flight training.

This undergraduate qualification is intended for career pilots; a 480 credit degree delivered in three years, structured around a set of core papers, delivered during the first two years that cover both technical subjects and non-technical subjects. The final year is devoted to either aviation business management papers - or the Massey University Flight Instructor course. Students graduate with all the examination credits for issue of an ATPL. Flight training is integrated as the practicum element of the academic papers, and students complete approximately 200-220 hours of flying and are issued with a NZ Commercial Pilot Licence and Multi-Engine Instrument Rating.

The School owns and operates a fleet of technically advanced Diamond single engine and twin engine aircraft equipped with full digital avionics approved for Performance Based Navigation (PBN) operations.

Massey University, uniquely in New Zealand, conducts a scenario based training (SBT) syllabus designed to develop the necessary competencies and skills for operating advanced technology aircraft, while retaining the basic flying skills required of any professional pilot.

It enables Massey's Flight Instructors to exploit the capabilities of their Garmin 1000 equipped Diamond fleet and challenges students with 'real world' situations that develop their decision making and airmanship.

A highly regarded feature of the flight training programme in the School of Aviation is the multi-crew training course. This Airline Bridging Course is designed to prepare students for functioning as flight crew members in air carrier operations.

The School also offers cadet pilot training for airlines, either as part of the Bachelor of Aviation (ATP) degree course which includes an internship, or as a professional pilot training programme with no tertiary qualification.

Massey's alumni include senior Captains and pilots in all the world's leading airlines such as Emirates, Cathay Pacific, Singapore Airlines, Qantas, Thai Airways, Aeroflot, Jetstar and of course Air New Zealand for whom Massey is a Preferred Flight Training Organisation.

Enrolments are now open for the July 2017 intake of the Bachelor of Aviation.



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A400M on show

contributed by Chris Gee

Perhaps the most recognisable aspect of the Airbus A400M is its set of eight-bladed 'Scimitar' propellers, operating in a DBE (Down Between Engine) configuration. The pair of propellers on each wing rotate towards each other from above, reducing prop wash and vibration while also delivering benefits to wing lift.

The RNZAF's 2017 Air Tattoo saw a debut visit of the strategic and tactical airlift Airbus A400M to New Zealand. Operated by the Royal Air Force's 70th Squadron based at Brize Norton Airbase in the UK, the visiting aircraft flew to Ohakea via Iceland, the USA, Fiji and Auckland's Whenuapai Airbase. With the retirement of the RNZAF's venerable C-130 Hercules looming, the decision on how they will be replaced is imminent, and the A400M's arrival obviously formed part of the European consortium's sales pitch to the Ministry of Defence.

Already ordered by the defence forces of Malaysia, UK, France, Germany, Belgium, Spain, Turkey, Luxemburg and Indonesia, the A400M has seen operational use in conflict zones such as Mali and Afghanistan with the French, and in the Middle East by the Turkish Air Force. 38 aircraft have so far been delivered out of a total of 174 ordered. The Germans have reduced their order, meaning 13 aircraft are now available from the current production run which may offer a chance for the NZDF to 'jump the queue' and have aircraft delivered in time to meet their operational requirements.

Specifications and Capability

The A400M has a cruise speed of Mach 0.72, a service ceiling of 40,000 ft and a maximum range (depending on payload) of 8,900km. The maximum payload is 37 tonnes, (the C-130's is 19 tonnes). The cargo box is 17.7 m long excluding the ramp, 4 m wide and 3.85 m high. The A400M can deliver the Army's 20 tonne Light Armored Vehicle to an operating range of 6,300 km, or its maximum 37 tonne payload out to 3,300 km. The 11 tonne

NH90 could be delivered further still, with everything it needs to self-deploy. An interesting undercarriage feature is an ability to kneel in order to lower the rear of the aircraft and reduce the crest angle between the ramp and cargo floor. This floor can be rapidly reconfigured by hand with one crew member as each roller flips over to form a flat floor. The A400M is equipped with eight stretchers as standard, but can accommodate up to 66 stretchers with 25 medical personnel. 116 fully equipped paratroopers can be carried.

The A400M's ability to fly at a stable and slow 110 kts allows for very accurate airdrops. A CARP (Computed Air Release Point), which automatically adjusts for wind effects, is linked to an Automated Release system. This would mean no more frenzied slide rule and protractor based calculations from the cockpit that are fed to a loadmaster with a knife, cutting straps in the cargo bay... Which would almost be a shame given how good the RNZAF C-130 crews are at that!

The dual paratroop doors have a deployable vane that ensures smooth and safe transition into the airflow, and both doors can be used simultaneously, reducing the 'scatter patter' and allowing a tighter landing formation for the paratroops.

The aircraft is capable of operating from soft and rough unprepared airstrips of at least 750m and to CBR6 standard. The FOD (Foreign Object Damage) threat to the A400M is greatly reduced by the smaller size of the inlets compared to a turboprop, with the propellers themselves designed to be the first layer of defence against sand and dust.

A FBW (Fly-By-Wire) flight control system and FMS (Flight Management System) is a militarised version of that used in the A380. There are dissimilar redundant control systems for

protection from battle damage or failure. An Enhanced Vision System projects images from an infrared camera directly only the pilots Head Up Display, allowing day-night low-level tactical operations in all weather. Weather mapping, wind-shear detection and ground mapping is by a similar radar to that which the RNZAF C-130s were upgraded with. The aircraft is equipped with a sophisticated DAS (Defensive Aids System) which includes the cutting edge missile warning sensors, with countermeasures dispensers, and the option of DIRCM (Direct Infrared Counter-Measures) to directly disable incoming missiles. Modern cockpit and loadmaster systems enable operations with a reduced crew of only three - two pilots and a loadmaster.

Air to Air Refuelling

The A400M comes plumbed as standard with an additional capability which the RNZAF does not currently have a requirement for, and that is AAR (Air to Air Refuelling). Designed as a tanker from the outset, the aircraft has an inherent fuel capacity of 63,500 litres, but this can be increased using extra tanks in the cargo hold. The wide speed envelope of the A400M allows it to refuel fast jets and large body aircraft, as well as helicopters. Although there is no need for the RNZAF to AAR helicopters, the ability of the A400Ms to air-refuel each other, and possibly whatever future assets might fulfil our Maritime Patrol and Surveillance needs in the future, may be worthy factor in the purchasing decision process - not to mention our ability to contribute to AAR requirements of allies.

The Alternatives

The RNZAF has been seriously analysing the NZ\$230m A400M as part of its investigation into how it will meet requirements set out in its recent Defence Capability Plan. Also under consideration is the Embraer KC390 (25t payload - \$116m), Kawasaki C-2 (36t payload - \$187m) and Lockheed C-130J (21t payload - \$130m). It is highly possible the Ministry of Defence will opt for a 'two-tier' approach, and back up a smaller number of high end aircraft, such as the A400M, with smaller aircraft such as the Airbus C295 (9t - \$50m). We can be sure that Airbus is offering this package to NZ. There was talk of purchasing two Boeing C-17s (70t and \$400m), but with only one

aircraft now available that is exceptionally unlikely, and while an extremely capable aircraft it would have been unusable for many of the NZDF's lower tier requirements. The coming replacement of the RNZAF's P3K2 Orions, for the Future Maritime Patrol and Surveillance Capability, is also a factor, and some manufacturers are offering sole-source packages to supply both requirements, such as Embraer proposing KC390s and E190-E2s, and Airbus who are offering Maritime Patrol versions of its C295.

Decision Factors

Unsurprisingly in an election year, the necessary Government decisions have been delayed until the next election cycle but with the RNZAF's fleet of post Life Extension Programme C-130Hs due to retire early in the 2020s, a decision will have to be made by the next government.

Two significant decision factors for the RNZAF are their rapid HADR (Humanitarian Aid and Disaster Relief) commitments, and their operations in and out of Antarctica. The A400M has a lot going for it in both of these areas. Since it can transport the Air Forces NH90 helicopter directly into theatre (with its blades removed), Pacific Islands would not need to wait for the NH90 to arrive aboard the HMNZS Canterbury (though the NH90 does have a limited capacity to self-deploy to some Islands). And the A400M's ability to transport a reduced load (but still more than the C-130 can carry) all the way to the Antarctic, and then return to Christchurch if the weather closes in, is a significant benefit. The B757 and C-130 pass a 'point of no return' enroute to the Antarctic, still hours away, where they must make a decision given current weather conditions there to either go ahead or abort and return. Given the recent and highly publicised 'below minima' emergency landing the B757 had to do in Antarctica, the NZDF is re-evaluating how it will operate from the Ice, and this could be a big tick in favour of the A400M.

Not uncommon for military aircraft development programmes, the A400M's development has been plagued by delays, controversy, and increased costs. However factor in the A400M's favour will be that the aircraft and its technology is now mature. Beneficially, the NZDF would be coming into the programme very late in the process with the aircraft scheduled to reach Full Operating Capability will all current customers by 2025.

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A personal insight

KiwiFlyer received a personal tour through the A400M before it was opened to the public at Ohakea. Squadron Leader Richard McPhaden, from RAF's 24 SQN Air Mobility Operational Conversion Unit has experience on both generations of C-130, the legacy aircraft and the new C-130J, and therefore was the perfect man to explain the main differences between the C-130 and the A400M. He says, "The capability increase is obvious. We can move more payload further, faster, and safer, and do so more efficiently and at higher altitude. But as a pilot the biggest improvement is in the flight control system. As well as the usual flight envelope protection you would have in an airliner, the A400M's mission management system allows us to tailor that system on the fly to meet our requirements. With the imagery from the EVS projected onto the HUD right before our eyes and the Terrain Avoidance Warning System, we can operate the aircraft tactically with a greatly reduced workload, without fear of losing control of the aircraft or flying into terrain. It really is a huge generational jump from even the C-130J. It is also very easy to train on, because the aircraft behaves identically to the simulator, and we can simulate every potential emergency or problem many times over. The loadmasters are also now much more integrated into the mission, via their workstation. The maintenance of the aircraft when deployed is a two-sided coin. On one hand it needs very little support on the ground, and is easier to maintain and operate forward deployed, but it is also a hugely complex aircraft, and this means there is more involved with maintenance than with the Hercules. Having said that the Health and Usage Monitoring System is very good and this aircraft will tell you everything that might become a problem."

Despite the aircraft's modern technology and high performance, it may well be the little things that will make the biggest difference to the 'end-user' i.e. the service men and woman who will be putting in the long hours in the cargo hold... The aircraft comes with not one, but TWO fully functional latrines, padded crash-worthy seats and has so little vibration and noise inside its pressurised fuselage that the experience is comparable to that of an airliner. For anybody that has endured an eight-hour haul in the C-130's webbed seats and been forced to use the 'piss-pot' down by the ramp, this could well be the most significant improvement of all.



The A400M cockpit



Head Up Display



Loadmaster's station



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Timaru Port. Construction of Timaru's artificial harbour led to a sandy beach forming (to right of image), known as Caroline Bay.

Fly in to Timaru

With 44,000 residents, NZTU has the largest population in South Canterbury and is the region's only city. The town developed because it was the only sheltered point on the coast between Banks Peninsula and North Otago and owes much of its prosperity to its artificial harbour. 2.5 million years ago, a volcano poured large lava reefs into the sea which created a natural harbour that early Maori used. Construction of an artificial harbour began in 1877, using the local bluestone, also prolifically (and very attractively) used for local building construction.

When flying into Timaru, watch out for scheduled flights, gliders, model planes and the microlight circuit at 500 feet AGL. There is seal 02/20 and grass 11/29, with the 11 vector threshold coincident to the paved eastern edge of 02/20. The AIP states no simultaneous operations. There is parking at the South Canterbury Aero Club and a small landing fee to pay at the honesty box. Swipe card fuel is available.

The club will call you a taxi or there are rental car companies based at the nearby terminal (organise this ahead of time so that

you find them open). Places to stay are vast but I like staying downtown so you are in walking distance of the sites and shops. The Grosvenor Hotel is an old fashioned (c.1875) but done-up hotel that has the feeling of faded opulence when you walk in. Average night stay is \$100 and there are choice of room types plus a restaurant on site. (www.thegrosvenor.co.nz)

A good first stop is Caroline Bay. I remember as a small child my mother telling me that her mother took her there when she was a child. It is voted as one of the top 10 beaches in NZ and is a very pretty and safe place to take children. There are BBQ and picnic areas, park space and a skate park. There is a board walk the length of the beach amongst the grasses and penguins to view when they come up to their nesting areas. The history of how the bay came about is that after the construction of the artificial harbour, currents created a sandy beach under the cliffs, which became inviting to holidaymakers and the locals alike. The Council leased the new foreshore from the harbour board in 1902 and they decided to turn the bay into a European-style beach resort. Tea rooms, a hot-water swimming pool and a band rotunda were all built. A 'sound shell' (for concerts) replaced the rotunda in 1937. Later, a piazza was built to improve access to the bay from the top of Bay Hill. Holiday carnivals have been held at Caroline Bay since 1911, attracting thousands. Check out the now 16 day event at www.carolinebay.org.nz.

For your refuelling stops, try the Arthur Street Kitchen - claimed to be the "funkiest" café by Lonely Planet. It has the very best coffee I have tried and the locals love the place. The other local secret is the Purple Lizard café which has the best cheesecake in NZ and is near the top of Stafford Street, so perfect to call into after your visit to the bay.

Then continue your stroll down Stafford Street, the thriving main street. This was formed along the old bullock trail where wagons were loaded and off-loaded from freight coming in on the landing service. In the 1870s the sea was NZ's highway and before the wharf was built the only way to collect the goods from ships in the harbour was to row out in 'landing boats' to collect it. The old landing service building was built in 1871 for this purpose but became obsolete in 1881 when the wharf was built, ending the boating service. It was then a storage facility for 99 years until 1984 when it was almost demolished for car parking but was saved by the people of Timaru and now houses the Rock Art Centre, the I-Site and Speights Ale house. Situated at the south end of Stafford Street it is an ideal place to stop for a look around and then a meal and cool drink afterwards.

The art-inspired should make a trip to the Aigantighe Art Gallery (the name is Scottish Gaelic for 'at home' and is pronounced 'egg-an-tie'). Built in 1956, it is renowned today for its public art collection and its sculpture garden. For night sky lovers a trip to the Kiwi Observatory will have you staring into the Milky Way and learning about the rings of Saturn. For history lovers the South Canterbury Museum (which like the gallery and observatory) is centrally located and has many collections to view. Learn about how the Maori and the early settlers lived and of course about Richard Pearse and his aviation endeavours near Temuka in the early 1900s.

Timaru (and nearby Temuka) had slow growth from the 1950s which explains why there are so many beautiful original buildings such as the Council Chambers to view as you walk through town. You can also take a walk just south of the town centre along Patiti Point. It has interesting whaling relics along the walking track as it was the site of the first European settlement in 1839 when a whaling station was set up.

One of my early memories of Timaru was jumping across a roadside fence to the Maori drawings. As a child it was fascinating - so if you are travelling with family or overseas friends, take them to the Te Ana Rock Art centre. Hosted tours also take you out to the drawings themselves which can be viewed from November to April. The drawings date back to over 700 years ago and while there are many sites in the South Island that have cave drawings, Nga Tahu formed a trust in 2002 to preserve this significant site for Maori, locals and overseas visitors alike to enjoy and learn from. (www.teana.co.nz)

There is so much to experience and see in this wonderful city. Make sure to add Timaru to your 'Places to Go' list.



Timaru Information Centre



Timaru District Council Buildings



Whaling Trypot at Patiti Point



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Yealands Classic Fighters 2017

Paul Le Roy attended Yealands Classic Fighters Airshow on behalf of KiwiFlyer this year and contributed this report for readers. Images are by Paul and his son Jared, plus Gavin Conroy and Geoff Soper.

The Classic Fighters airshow (this year with Yealands as headline sponsors) at Omasaka airfield in Blenheim is a must-do for aviation enthusiasts. Held over Easter weekend the biennial event has an international profile and attracts many thousands of spectators with accommodation, hire cars and camper vans booked up to a year in advance. This year the weather Gods tried their best to cause chaos - but organisers managed to keep one step ahead with the show going on to enjoy a weekend blessed with wonderful aircraft-filled blue skies.

This year's show was opened by the RNZAF Black Falcons aerobatic display team. Also on show from the Air Force was the A109 Light Utility Helicopter, the NH90 and the latest version of the Navy Seasprite SH-2G(I). As well, a C-130H Hercules was on hand to deploy the Kiwi Blue parachute display team.

From the RAAF came their new C-27J Spartan which can be operated from rudimentary airstrips and is used to support humanitarian missions in remote locations.

Classic Fighters is noted for its theme re-enactments and a vast array of equipment, including two Mark IV heavy tanks, was deployed during the WWI battle. In the air the Fokker scourge was met head-on by Sopwith, Airco and Nieuport aircraft, the latter being victorious, of course!

The WWII re-enactment boasted a German Panzer IV, an America Stuart, a Nebelwerfer and a malfunctioning Panjandrum!

The star of the ground theatre must be the V-1 flying bomb, this time the launching rig being deployed by a SDKFZ 251. In the sky above the battlefield Spitfires, Kittyhawks and Yaks duelled with the marauding enemy Harvards.

An ongoing challenge for the organisers is to continue to provide a star of the show. This year it was to be Steadfast, a Yak-3 powered by a radial engine! It was conceived due to the need for more performance and overheating problems of the V12 Kimov engine. Steadfast is a copy of the original Yak-3U/82 prototype with the fuselage strengthened to cope with the Pratt and Whitney R-2000 radial engine.

Steadfast's aerobatic display is enhanced by the addition of two wing-mounted smoke generators which produce long smoke trails that lingered long after the machine had passed, sometimes long enough to be incorporated into other parts of the display!

Another star performer was the delicate ballet-like demonstration of the Ryan STM-2 low wing monoplane, its polished metal surfaces glinting and gleaming in the sunshine.

One must not forget to mention the great variety of food, drink and merchandise on offer and the wide range of ground displays, vintage farm machinery, classic cars and military vehicles. If this is not enough, there is the world-renowned Omasaka Heritage Centre and Omasaka Classic Car collection close by.

This event cannot take place without a vast army of dedicated organisers, volunteers, sponsors and importantly the superb pilots. These people spend many hours putting the show together and must be congratulated for putting on a world class event. I can't wait to see what will be on offer at the 10th anniversary show in two years' time.

Paul Le Roy



The Vintage Aviator Limited's Fokker formation: 7 Dr.I Driedekkers and a D.VII.



Also representing the enemy, the Pfalz D.III.



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The Red Star Yak-52 display team. Might we see another soon to match the Black Falcon's nine-ship efforts?



1909 Bleriot XI replica.



German troops take cover beside a Panzer IV tank.



The battle rages on. Note shells flying.



It wouldn't be a war themed airshow without pyrotechnics.



John Luff in his magnificent De Havilland DH 112 Venom.



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The radial powered Yak-3U 'SteadFast', star of Yealands Classic Fighters 2017 at Omana - Gavin Conroy photograph



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Classic Fighters 2017



I like the shark one, says Finlay Norton age 4.



Keith Skilling in the FG-1D Corsair.



Graeme Frew puts the Yak 3M through its paces.



Jim Rankin lifts off in the Grumman TBM-3E Avenger.



The Reid family's Avro Anson Mk1 closes the 2017 show with a poppy drop in memory of fallen soldiers.



Stalwarts of the NZ airshow scene: The Roaring Forties Harvard Display Team.



Spitfire duo, MK XIV and TR.9.



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The Royal New Zealand Air Force commemorated its 80th anniversary in style this year, holding a large 'Air Tattoo' at Ohakea Airbase on the 25th and 26th of February. The RNZAF became an independent service in 1937, and this airshow formed the highlight of its celebrations to mark the occasion. It was a truly international affair with no less than seven foreign nations participating and performing thrilling displays for the 30,000 strong crowd. Chris Gee contributed the text for this article, with Chris plus Gavin Conroy, Paul Le Roy, and Geoff Soper contributing images. Your Editor took a few too, but was largely humbled by the quality of what everyone else sent in. Thanks Team. Enjoy. It's probably five years before we'll see anything like this here in NZ again.



Happy Birthday RNZAF

The Royal New Zealand Air Force commemorated its 80th anniversary in style this year, holding a large 'Air Tattoo' at Ohakea Airbase, on the 25th and 26th of February.

The RNZAF became an independent service in 1937, and this airshow formed the highlight of its celebrations to mark the occasion. The last time the Air Force held an airshow was five years ago, for its 75th anniversary, and it is remembered for its intense traffic troubles. This year however things went very smoothly. The weather was superb, the flying was excellent, and the attendance was good, with just over thirty thousand people attending over the two public days. International participation was high this year, with assets coming from New Zealand's defence partners all over the world, including Britain, United States of America, Australia, Canada, New Caledonia (France), Singapore and Japan.

The RNZAF's Lead Planner for the Air Tattoo, Wing Commander L.G. Wilson, was handed the unenviable task of putting together a world class event by the then Chief of Air Force Vice-Marshal Mike Yardley. Despite the spectacular displays by the foreign fast jets and heavy lifters, the NZDF's main priority was to share the story of what the RNZAF and NZDF provide to New Zealanders. "We drew inspiration from the best air shows from around the world and designed the layout in such a way that our people, irrespective of trade, could entertain the public by engaging with them and sharing their part in our story. The spectators left with a better understanding of who we are and what we do for our country. From my perspective, the most enjoyable and rewarding aspect of planning this event was providing the opportunity for the Airman of the RNZAF to outshine the spectacular aircraft displays."

The traffic management issues of the last airshow were overcome this year, with a distributed 'Park n Ride' system used, and all tickets available online only. This was a big departure from the usual, and was something of a risk, but was a model copied from successful foreign events, with a company with much experience in large scale events hired to design and facilitate the system. According to Wing Commander Wilson; "There was overwhelmingly positive feedback from the public. The management team were very happy with how it went, with no reported problems. Park and ride has been used with mixed results at other events in New Zealand, so we were very happy with the high uptake for the Air Tattoo."

The real drawcard for the airshow was without a doubt the foreign contributors, especially the fast jets. Two Australian F/A-18s, Two American F-16CJs and two F-15SGs from Singapore were on hand to provide a sight not seen at Ohakea since the 1980s. Tactical and Strategic airlift was of particular interest this year, with the participation of the A400M, C-17 and C-130J aircraft being prescient, as the government ramps up towards choosing a type (or types) to replace the RNZAF's C-130 Hercules. Every type in the RNZAF's inventory was in attendance, along with heritage aircraft that saw RNZAF service. The usual fleet of classic and warbird aircraft for which New Zealand airshows are so famous were not in attendance, but this was a very different airshow, being a public event with specific objectives and not a private venture.

Congratulations to all the organisers and participants are well deserved. It was a great couple of days.

Left: Part of the show finale - decoy flares falling from an RNZAF Hercules.
Michael Norton image.



RNZAF Formation 'Thunder': B757-200, 2x C-130H Hercules, P3K2 Orion.



Head to head in RNZAF Beechcraft T-6 Texan IIs.



Around 30,000 spectators enjoyed a spectacular two-day event. At only \$15 a ticket, they also enjoyed excellent value for their money.



In the foreground is the USAF KC135 air tanker. At rear and above, the mighty USAF C-17 A Globemaster III.

United States Air Force

This was the first time since the TRIAD84 Exercise in October 1984 that USAF fast jets have been seen in New Zealand, with the U.S. Government's long overdue acceptance of New Zealand's nuclear free policy now meaning we can now enjoy visits by assets declared to be non-nuclear armed, as shown by the recent visit of a US Navy warship for the RNZN's 75th Anniversary celebrations. Based at Misawa Air Base in Japan, the Pacific Air Force's F-16 Demonstration Team arrived with two F-16CJ Block-52s and a KC135 as tanker support. Major Richard 'Punch' Smeeding flew exhilarating solo displays that really served to show off the potency of this small, agile light fighter. After 4,573 examples built the F-16 is one of the most successful fighter jets of the modern age, with the RNZAF coming very close to also operating this type. The well-practiced routine came with an entertaining commentary that was 'hammered-up' in true American style, serving to remind us of how alien to us the 'war as sport' ethos is.

The Boeing C-17 A Globemaster III is a common visitor to New Zealand, especially in Christchurch from where they operate to Antarctica. Flown by Captain Edward Sutton and his crew, the aircraft was literally thrown around the sky as it displayed its exceptional maneuverability. Despite being capable of lifting a 70 tonne payload over great distances the C-17 has excellent STOL characteristics, which it displayed by stopping in a ridiculously short distance, then reversing back up the runway, to show just how small an area this huge aircraft needs to operate.



Chris Gee image



The supreme highlight for many at the airshow, was the exceptionally polished display by the Pacific Air Force's F-16 Demonstration Team.



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Royal Australian Air Force

Our friends from 'across the ditch' brought two F/A-18A 'legacy' Hornets. These remarkable aircraft, flown by FLTLT Matt 'Trails' Trayling and WGCDR Scott Woodland, flew thunderous solo displays, as well as taking part in the 'scenario' finale of the airshow. Their vapour-heavy high manoeuvrability displays are always a great sight. Soon these 'legacy' Hornets will be phased out as they are replaced by the new F-35A Joint Strike Fighter, which will be operated alongside their new F/A-18F Super Hornets and EF-18F 'Growler' Electronic Attack aircraft. It may well be some years before we see those types visiting our shores, maybe in another five years for the 85th anniversary! The RAAF's C-17 Globemaster III was very popular in the static displays, with thousands of people poring over it. Its cavernous interior is truly jaw dropping to behold. It was interesting to notice the RAAF C-17 sporting very advanced DIRCM (Direct Infra-red Counter-Measures) turrets, used to directly disable incoming missiles.



The cavernous hold of the RAAF C-17 Globemaster III received many visitors.



Friendly display rivalry led to boasting of two tails and two engines by the RAAF F/A-18A display commentary team. Note arrestor hook and speed brake lower left.

Republic of Singapore Air Force

New Zealand has a long history of defence cooperation with Singapore who, as a tiny island nation, often uses the NZDF's spacious training and live-fire areas. For the first time ever the RSAF brought two of their impressive Boeing F-15SG Fighter Bombers. Though participating in the static display only, they attracted a great amount of attention, and their crews graciously had their ears chewed off by many people over the two

days. There are discussions taking place at a high level as to whether it is feasible for the RSAF to base a squadron of their F-15SG here in New Zealand. Not only do they appreciate our nations excellent training characteristics, both in terms of area, terrain and unpredictable weather, but it also allows them to have more assets 'off-island' in case of a debilitating first strike.

Singapore has 40 F-15SGs, which are

essentially identical to the USAF's F-15E Strike Eagle with only minor differences to the avionics. Joining them were two out their ten C-130H Hercules. The Singaporean Hercules are undergoing a similar upgrade to the Life Extension Program that the RNZAF's C-130s went through, although theirs will add more KC-130H tanker aircraft to their fleet in the process. One was available to the public in the static display.



Royal Air Force

Despite the obvious history between New Zealand and Great Britain, Royal Air Force aircraft are not frequent visitors, however on this occasion they sent one of their brand new Airbus A400M airlifters, with the inertia for the trip most likely coming from Airbus, who is trying very hard to sell the type to the New Zealand Government as a Hercules replacement. While this highly capable machine attracted great attention in the static display, a flying display was sorely missed - the image below being taken when the aircraft arrived on Friday.

Given its apparent suitability for RNZAF purposes, KiwiFlyer has featured the A400M in a separate article within this issue.



Propellers on the A400M are staggered and rotate towards each other.



RAF Airbus A400M, easily recognised by its 8-bladed scimitar shaped propellers.

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Canadian Air Force

The Defence Forces of Canada and New Zealand have a long history of working together, but usually this is at a staff or flag level, so their contribution of a Lockheed CC-130J-30, a stretched version of the latest generation C-130J Hercules, from 436 Transport Squadron was welcome. A possible contender for the Hercules replacement, the CC-130J-30 is an entirely new aircraft from the previous generation of Hercules, and can carry more payload faster and more efficiently. Whilst it might not offer the biggest capability and performance increase over its competitors, it does have New Zealand's history with the Hercules on its side. On the other hand, since it is such a different aircraft from its ancestor, commonality in support and training is not as great as it would seem. Unfortunately, the aircraft spent the air show hidden away behind the A400M in the static display, yet it still attracted many visitors.



Canadian Air Force CC-130J-30

New Caledonia Armed Forces (France)

The New Caledonian Armed Forces CASA CN-235 is a regular visitor to New Zealand, often training alongside the NZDF as they share similar HADR (Humanitarian Assistance and Disaster Relief) responsibilities, including joining in on the recent Skytrain 2016 exercise. CNE Vincent Frerre and his crew demonstrated their small airlifter capabilities well during their display. The CN235 has found success all over the world, with its 6 tonne payload and STOL capabilities in high demand. A larger and modern version of the CN235, the Airbus C295, is a possible contender as a low-tier part of the Hercules replacement programme.



New Caledonia Armed Forces CASA CN-235

Japanese Air Self Defence Force

The Japanese Air Self Defence Force committed a KC767J to the event, which was on static display. The recent engagement from Japan, which included two Kawasaki P-1s deploying here for the RNZN's 75th celebrations and helping with surveillance during the Kaikoura earthquake disaster, comes on the heels of new laws in Japan finally allowing them to export defence technology. They are actively trying to sell their Kawasaki P1 as a replacement for the RNZAF's Orions, and their Kawasaki C2 to replace the C-130 Hercules. Both are formidable and capable machines. Japan's 1st Tactical Airlift Wing 404 Squadron has four KC767J aircraft, which it uses for both air-to-air refuelling and strategic transport. They can use both the 'hose and drogue' refuelling method, as well as an Advanced Aerial Refuelling Boom System that is operated from an all-digital Remote Aerial Refuelling Operator Station (RARO II) just behind the cockpit.



Note cameras side and rear.



KC767J refuelling boom.



Flying the flag from a cockpit window during the static display was a nice touch.



The Japanese Air Self Defence KC767J was a popular aircraft on static display.

Heritage

Despite many of New Zealand's Warbird regulars not being in attendance, there were some fine displays by aircraft from the RNZAF's past. The RNZAF's own Historic Flight's Harvard, flown by FLTLT Stu Anderson performed - it would after all, not be a proper Kiwi airshow without a Harvard display! The mutually beneficial arrangement between the NZDF and Brendon Deere's 'Biggin Hill' Historic Aircraft Centre, located on the Airbase, saw his Supermarine Spitfire Mk. IX, and Grumman TBM-3E Avenger, both flown by the somewhat over achieving SQNLDR Sean Perrett, display at the airshow, along with their Harvard flown by Dave Brown. Mitty Brereton and Bill Lamb flew the beautifully restored de Havilland DH-104 Devon in formation with two Harvards. It was a shame the Venom did not fly, but added to the heritage static displays where it was joined by an ex-RNZAF Aermacchi MB-339 and a newly restored Harvard.



Sean Perrett brings the Grumman Avenger in for a simulated carrier landing.



Brendon Deere's Mk. IX Spitfire with a C-17 Globemaster in the background.



de Havilland DH-104 Devon and Harvard formation.



RNZAF Hercules delivering a CDS (Containerised Delivery System) pallet.



This time it's a landing and LOV deployment for ground troops.



RNZAF Hercules on a low pass with door open and crew waving to the crowd.

Royal New Zealand Air Force

The hosts of this birthday bash really put an effort in to show themselves off at the Air Tattoo 2017. For the first time they pulled together a 'mass take off' with all current types in service lining up. The A109LUH, SH-2G(I), NH90, T-6, B-200, P-3K2, C-130H and B757 all formed one flight, known as 'AirForce'. The call 'AirForce – cleared for take-off!' is probably a unique one. The Air Force band played in front of these aircraft, along with a convincing haka performed by RNZAF personnel. The RNZAF's heavy metal came together in the form of 'Formation Thunder', comprising the Boeing 757-200, flown by FLTLT Ben Woodhouse and crew, two C-130H(NZ) Hercules flown by WGCDR Andy Scott's and FLTLT Alex Tredrea's crews, and the P3K2 Orion flown by SQN LDR Rod Oliff and his crew. They performed very tight formation flying together, along with an impressive 'break' towards the crowd. Each aircraft performed its own display, with the No.40 SQN B757's famous max-rate climb being a highlight. The P3K2 from No.5 SQN performed a scenario display, dropping rescue supplies. The two C-130Hs from No.40 SQN carried out both solo and scenario displays, showing off their versatility as they performed precision airdrops of CDS (Containerised Delivery System) pallets onto the airfield, as well as tactical landings of an LOV (Light Operational Vehicle) and troops, as well as a drop of two of the KiwiBlue Parachute Display Team, W/O Lev Leatherland and W/O Kevin Pope, from PTSU. The airshow finale was provided by a spectacular release of flares from one of the C-130s.

With some of the airframes being up to 52 years old, all three of these aircraft types are due for retirement starting from 2020, so there are some very big decisions coming up as to which platforms to replace them with. The government has sent out RFI's (Request for Information) to industry for its Future Air Mobility Capability (FAMC) requirement, and there are multiple aircraft in the running, such as the Airbus A400M, Embraer KC390, Kawasaki C-2, Lockheed C-130J, Leonardo C-27J and Airbus C295, as well as the C-17 as a long shot. Also RFI's have also gone out for New Zealand's Future Air Surveillance Capability (FASC) requirement, and in the running are the Boeing P8 Poseidon, Kawasaki P1, SAAB Swordfish (Bombardier G6000 and/or Q400), Leonardo ATR-72MP and Airbus C295 Persuader.

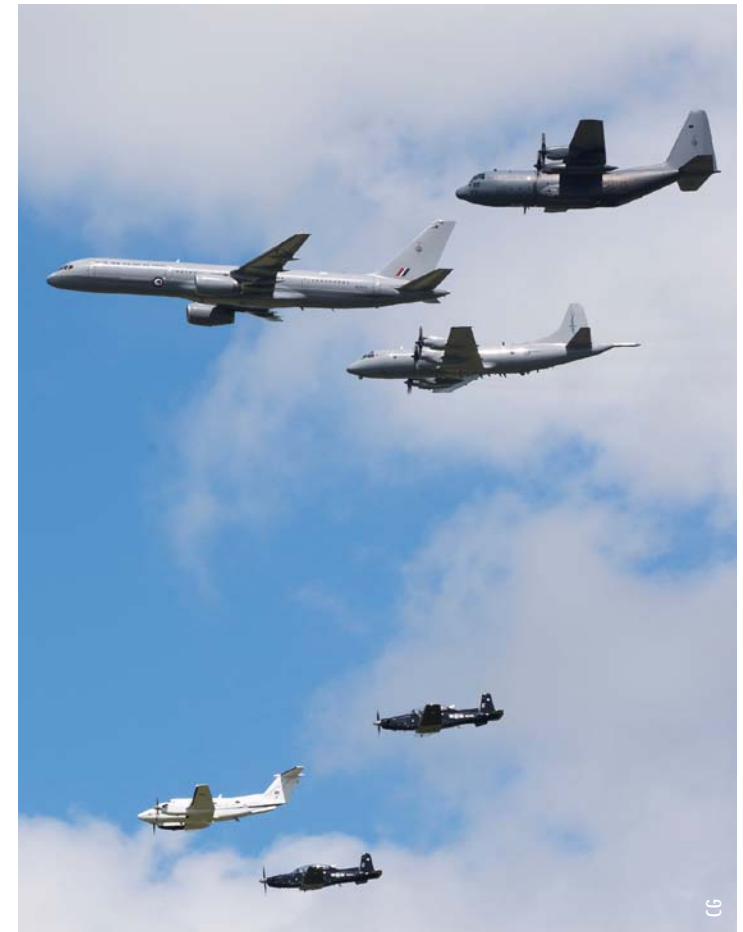
The RNZAF's fixed-wing training assets came together to form 'Formation Lightning', comprised of one newly leased Beechcraft King Air B-200 of No. 42 SQN and two Beechcraft T-6 Texan II Advanced Trainers from No.14 SQN. Twice an attempt was made to get Formation Thunder, Formation Lightning and a



Kiwi Blue Parachute Display Team in action.



Black Falcons T-6 Texan barrel rolls around two more, one of which is inverted.



RNZAF Formation Thunder and Formation Lightning together.



RNZAF B757-200 in max-rate climb mode.



RNZAF mass take-off of all current types about to commence with call-sign AirForce. Front to back: A109LUH, SH-2G(I), NH90, T-6, B-200, P-3K2, C-130H and B757.

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RNZN Kaman SH-2G(I) during a solo display.



An RNZAF A109 LUH displayed and also acted as official camera ship.



Kaman SH-2G(I) simulating a sailor rescue from a stricken vessel.



RNZAF NH90 performed operational rather than handling displays.



NH90 on static display, 'folded' and ready for maritime deployment.



RNZAF NH90 'Warrior Flight' in action. L to R: slinging a pallet, air-lifting in a 105mm light gun, and with soldiers fast-roping onto the ground.



formation of the three helicopter types overhead the airshow at the same for a unique photo opportunity, but it never quite came off, although there are plenty of photos of the Lightning and Thunder formations together.

The new Aerobatic Display Team 'The Black Falcons' had their debut at the 2017 Air Tattoo, since their previously planned debut at the Wings over Wairarapa Airshow in Masterton the weekend before was unfortunately cancelled due to atrocious weather. The team has big shoes to fill, since their predecessors 'The Red Checkers' had become something of a New Zealand Aviation institution, and their display did not disappoint. The five pilots of the Black Falcons, SQNLDR Brett Clayton, SQNLDR Hayden Sheard, SQNLDR Sean Perrett, FLTLT Dan Pezaro and FLTLT Stu Anderson, performed an amazing display in their new aircraft. They formed up with four more aircraft to perform a 'Diamond Nine' formation (see separate article this issue), and then together showcased their well-rehearsed tight formation flying skills. A solo Texan II routine was flown by SQNLDR Tony Budd. As this issue goes to press the team is about to take its routine around the South Island of New Zealand as part of the RNZAF's ongoing 80th Anniversary celebrations.

Three of the RNZAF's NHI NH90 Medium Utility Helicopters from No.3 SQN took part in very active flying displays, displaying their capability to airlift 105mm light guns, fast-rope soldiers and deploy troops and payloads in various scenarios. Collectively known as 'Warrior Flight', they were led by FLTLT James Mackenzie. While initially controversial, the NH90s have since begun to prove themselves. Two examples were in the static display, one in 'role' configuration with machine guns and external fuel tanks fitted, while the other was folded for maritime deployment, and attached to its MANTIS remote control towing unit. The NH90 will soon be fully deployable from the RNZN's HMNZS Canterbury, as well as the new upcoming 24000 tonne HMNZS Aotearoa, the combination of which will be huge boon for the NZDF's HADR (Humanitarian Assistance and Disaster Relief) capabilities.

The Agusta (now Leonardo) A109 Light Utility Helicopter from No.3 SQN, flown by FLTLT Chris Hall and crew, performed its own display, and also operated as a camera ship for the RNZAF, (see mass take-off photo). This aircraft performs a multitude of roles for the NZ Government, from initial rotary wing pilot training for the RNZAF to Tactical Transport, Law Enforcement Support, VIP transport and Special Operations support.

The RNZN's new Kamen SH-2G(I) helicopter performed a solo flying and 'role' display, winching a sailor from a simulated stricken vessel. These new helicopters from No.6 SQN are maintained by the RNZAF but flown and operated by RNZN Pilots. These ex-Royal Australian Navy Helicopters are good example of the NZDF making the best out of limited funding.

The Australian attempt to introduce these helicopters into service became a complete debacle, with requirements for a 4-axis 'hands-off' tactical autopilot (in an attempt to operate with just two crew), among other additions, leading to cancellation of the project at huge cost to the Australian Government. The RNZN has no requirement for these niceties, and the purchase of eight of these helicopters, along with two airframes for spare parts, allows an impressive capability increase over our previous SH2Gs, with modern avionics and the new Kongsberg Penguin Anti-Ship missiles. As well, we now have enough airframes to deploy three helicopters simultaneously on the RNZN's Frigates and OPV's, for the cost of what would normally buy just a few airframes.

Commentary and Infrastructure.

The commentary this year was excellent, with Air Display Commentator SQNLDR Kate Bint and Ground Display commentator SQNLDR Mike Ward providing a great service. Kate is an ex RAF C-130 pilot, who moved to NZ in 2006, and is now the Executive Officer of Flying Training Wing. Mike is Ohakea's Base Executive Officer.

It was something of a shame that as always, and quite unnecessarily, the speakers were placed in front of the crowd line facing back towards the audience, as opposed to being situated bi-directionally within the crowd line, facing both the runway and behind, since the entire flight-line was full of thousands of spectators trying to photograph the aircraft through the speaker stands. As a sound engineer with decades of international festival experience, this author can tell you that it is entirely within modern 'health and safety' standards to put speaker stands within the crowd area to leave the flight-line free of obstacles; they can be weighed down with sandbags and fenced off with the cables secured to the ground with U-Pins, or they can be hung off dedicated cluster towers. It is commonplace internationally to have an entirely uninterrupted view of the flight line.

That said, the airshow infrastructure was very good, with a variety of food stalls, ATM machines and toilets available, and as mentioned the traffic management plan worked a charm. A big plus for many was the area set aside right next to the gate for self-contained campervans, where hundreds enjoyed three days of proximity and view. Well done to the RNZAF and NZ Motor Caravan Association for setting this up. The park and ride also worked very well, as did the early opening time of 7am, which allowed people to get in well before flying started at 10am.

All and all it was a very well-run event which also delivered significant benefits to the local economy, with much of the available accommodation being booked out months beforehand.

Sincere congratulations to everyone involved. Bring on the 85th.

Chris Gee



A rousing lunchtime haka from RNZAF staff.



Air Display Commentator Kate Bint.



RNZAF Brass Band.





Mike Slack in Giles G202 ZK-NUT. Wayne Ormrod was flying the camera plane.

Timing is Everything

Most aerobatic manoeuvres require a degree of timing finesse in order to be carried out successfully. It's Grant Benns' focus for this issue as he continues his series. The subject: Square Loops.

Never a truer statement has been said - we can all relate to the expression 'timing is everything'.

The square loop is a prime example of getting the timing right. Whilst the name of this manoeuvre may sound like a contradiction in terms - "isn't a loop round?" - a loop can be

flown 'square' and as such poses one of the bigger challenges in competition aerobatics. I'll share some mind-bending variations of a square loop later on, but in the meantime let's ponder the basics of this manoeuvre.

The basics

For a start, a square loop is a full loop in that there is 360 degrees of pitch involved; we finish in the same direction we started and there is no rolling component. I was about to say it is 'pull' manoeuvre, like a regular round loop, but that flat bit across

the top actually needs a 'push', so figure on having a plane with some inverted capability and good seat belts.

Judging Criteria

As with every competition manoeuvre there are 'judging criteria' that must be observed in order to please the judges and maximise your score. Specifically:

- All four sides must be equal in length.
- The corners - which incidentally aren't flown as drawn (i.e. a 100 G right-angle turn!) must be flown with an equal radius.
- And just to make it interesting, each radius must look the same from the ground which means they must be corrected for wind.

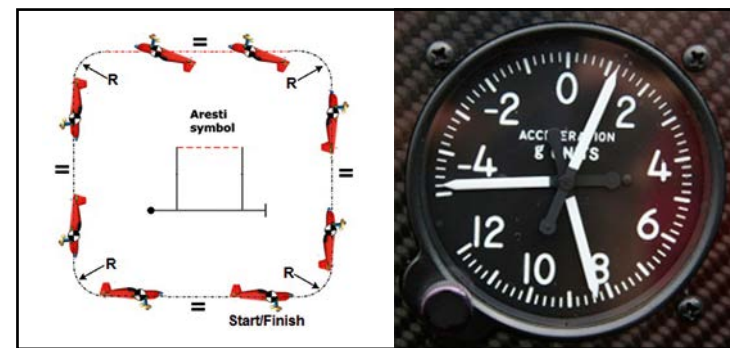
Wind correction

That last point sounds tricky, huh? What this means is that the pilot must adjust his/her stick inputs to vary the 'still-air' radius of the 1/4 loop so that each 'wind-adjusted' 1/4 loop looks both round and also the same size and shape of other 1/4 loops in the manoeuvre. Really?!

Well, in the ideal world, 'yes', but in the real world this is both incredibly difficult to achieve and also incredibly tricky to judge. This last point comes back to a basic limitation (human factor) which differentiates humans from computers - we have quite short and fallible memories. Without having some physical system of measuring the radius, the judge must rely on their somewhat poor memory of what happened 5 seconds ago (or more) to compare the current looping radius with the previous one (or two, or three). The same applies for the judgement of the length of the lines of the square loop. What you may see a judge doing is holding up a pen or piece of card (your sequence card) to mark the beginning of the manoeuvre and/or measure the length of the first line to determine the relative lengths of subsequent lines.

Ground flying

As you can now start to appreciate, the judge is actually in the best position to determine the correct lengths of the lines, which is unfortunate for the poor pilots, grunting and groaning



Just another day at the office.

through their manoeuvres, and trying to guess the right times to push or pull. I have watched model aircraft pilots who fly their aircraft in aerobatic competitions, who wonder how we - big plane pilots - cope with both the 'G' and in particular timing the piloting manoeuvres. Of course we can't see what we look like to the judges in real time, whereas the model aircraft pilot obviously can. Conversely, I marvel at how they can fly an aircraft through a sequence without having any inside perspective or seat-of-the-pants feel for the subtleties of flying, such as rudder-balance or G-buffet.

Equal Radii

So back to the world of our poor 'real' pilot trying to judge the radius of the four corners of the square loop. As with a normal, full loop, the stick pressure will vary through the loop to maintain the same radius, although the stick position will be roughly the same throughout - except with the square loop each 1/4 is separated by straight lines, two of them vertical. Bugger. Sadly too, pilot's memories are shorter than judges, so practice and repetition must be carried out to lock in the muscle-memory to determine the correct stick positions. Now you just have to adjust that for the actual entry speed on the day, and consider the wind effect and you will have it nailed!

At some point you just have to accept that it is near-impossible to get each radius exactly the same, and hope that you can dazzle

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Vertical in ZK-NUT

the judges with your prowess at getting the lines the same length, which brings me – finally – to my point about timing.

Speed and G

Consider you are flying the square loop in your very capable, advanced aerobatic mount – I shall use the Giles G202 as my example. Typical entry speeds for most upward manoeuvres including the square loop are 170-180 kts. Because the aerobatic ‘box’ you are competing within is quite small at just 1000 m long, wide and high, you have to ‘pull’ at least 5 G – and sometimes up to 8 G – to keep the overall loop small enough. From the aeroplane’s point-of-view that’s fine, as it is stressed to 10 G, has 240 hp and weighs about 1400 lbs fuelled-up with you and your parachute. From the pilot’s point-of-view that’s okay too – you are a practised, G-fit, finely-tuned machine (cue Top Gun music). To be honest, the ‘G’ just becomes background noise and a bit of a nuisance after a while – especially when things occasionally go a bit ‘dark’ (you temporarily lose your vision) – therefore you should have plenty of mental capacity available to focus on the subtleties of stick-pressure and looping radius. Yeah, right!

When to pull

So, picture you are zooming in straight-and-level for your square loop, at 180kts. You execute a perfectly curved ¼ loop and are now looking straight up, climbing vertically at about 10,000 feet per minute

(briefly). How long do you wait to pull on to your back for the top of the loop? As logic would suggest, the line across the top of the square loop is going to be commenced at a speed much slower than 180 kts – think about 60kts, the slowest speed you will get to during the whole manoeuvre – so therefore this up-line doesn’t have to last for very long at all, relatively. As well as the length of the line to consider, you will want to have some speed in hand to craft a ¼ loop of an equal radius to the first ¼ loop that you wrenched at 6 G, so perhaps you start the pull for the second ¼ loop at 120 kts, to be flying straight-and-level (but inverted) at around 60 kts. Now level inverted, with the fantastic power-to-weight ratio of the Giles you quickly accelerate to about 80 kts and commence another finely-judged ¼-loop to the vertical down-line. Nice. But now you have gravity helping you and that pumped-up Lycoming to accelerate, so the down-line will be of similar length of time to the first vertical up-line – can you remember back that far? – before the final big pull to horizontal flight. A quick check of the altimeter (same height that you started at – geez, you’re good), a little buffet as you fly through your own wake-turbulence from the start of the manoeuvre, and you have finished the forth side to ‘close’ the square loop.

Vertical lines

Regarding the vertical lines, and this goes back to the judging criteria, they

are flown on the zero-lift attitude of the aircraft, i.e. the wing is at zero degrees angle-of-attack, versus the horizontal lines that are flown in level flight, albeit at differing attitudes depending on the speed.

If you have made it this far with me, well done – it is quite hard describing and understanding in a thousand words (*actually you’re nudging 1300, Ed.*) something the hands can convey in seconds. Such is flight.

Timing

By now you’ll appreciate how this manoeuvre, more than most, relies on timing – and the measurement of time in your head – to achieve the equal length of the lines. Yes, you can use speed references as I have done above to decide when to commence various ‘pulls’, but this only comes from practise and, importantly, ground critiquing, to relate the visible length of the lines to another unit of measure that is usable in the cockpit. As with many aerobatic manoeuvres, using a mental metronome in your head, ticking away at a steady pace, to time the separate segments will help with your rhythm. For

the square loop, it might sound like this:

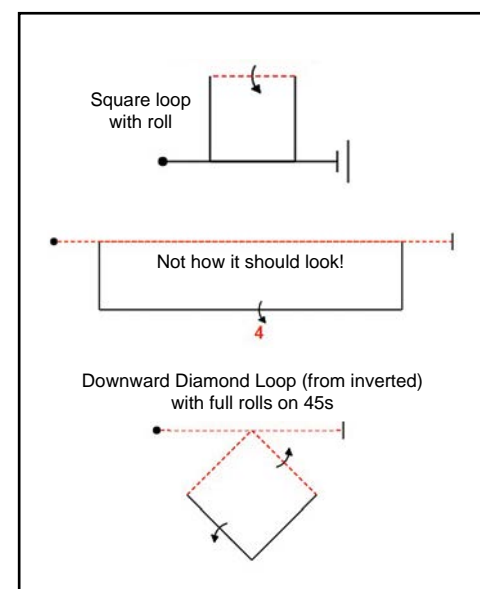
“Pull – one...two – Pull – one...two...three...four – Pull – one...two – Pull.” (Add your own tick-tock noises).

Getting evil

After reading and digesting the above, how much more ‘evil’ can a square loop get? How about adding a roll across the top line? Obviously, you will need a fast rate-of-roll to achieve that, which most of the advanced/unlimited aircraft have.

How about a downward square loop? With a 4-point aileron roll across the bottom? I saw this flown by all of the Unlimited competitors at the Australian Nationals a couple of years ago. It was hideous to watch, but not from the point-of-view of physical discomfort – the time it took to fly the 4-point roll at the high speeds achieved after pulling out from the first vertical down-line meant the bottom line was about 2 km long. The results were more of a rectangle than a square and we lost sight of some competitors, into the heat/brown dust haze!

How about a downward diamond loop, with a couple of rolls thrown in? Truly evil!



When hard gets easy, there's always harder!

Footnote: These articles are intended to whet appetites for advanced flying and to offer tips to aerobatics beginners. Dual instruction and observance of CAA rules is a must-have – especially for safety and also for learning correct techniques and finesse of manoeuvres for the particular aircraft you are flying. For more information, enquire about aerobatics instruction at your local aero club or see www.aerobatics.co.nz



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One of Jason's gliding land-outs. Not a single plant damaged! Perfect practice for 'landing out' in a powered plane when the need arises.

Grateful for Gliding

About a couple of months back, Auckland pilot Jason Williams took his wife Trish on a nice Saturday flight to Raglan. He hired a power plane for the day. I'm not allowed to mention what aircraft it was as Jason doesn't want people thinking negative things about the aircraft type. Jason's flight ended in what he calls an out-landing, but what most power pilots would call a forced landing due to engine failure. Jason is also a glider pilot and he says he and his wife, the aircraft, the bulls and sheep, all ended up unscathed because of his gliding training. This is Jason's explanation of what happened.

The engine went bang at 1000 feet AGL and 91 seconds later we had the wheels on the ground. At the time I was roughly 80 hrs Qualified Glider Pilot (QGP) and 70hrs MPL. Looking back at the thought process was interesting. It was humbling and educational comparing the training we do for this event in powered

aircraft, from 3000 feet, to the real thing at 1000 feet. For those interested it went something like this:

Jason to Trish: *This will be a bit bumpy through here, you might want to snug up your straps.*

We both tightened our shoulder straps.

Jason thinking: *There's that Ag strip I saw on the way in, good place to land...*

Engine: Bang! Shudder! Lose power.

Trish: *What was that?!*

Jason: *That was an engine failure...*

Jason thinking: *Loads of vibration, cut the power, catastrophic, low, got no time, forget fuel, ignition, blah. Look for smoke. OK, no smoke. Likely no holes in the side of the engine so I can still see, but for how long? Shit, it is shaking! Mayday? Squawk 7700? Too busy... Setup... Too close to the field. I CAN get into that. Not enough height for a circuit, Bow tie, turn away and around. Eyeball the glide back to Raglan while we are here, NO. Still have a little*

power but for how long? Will this vibration shake the engine off its mounts? Not now but if it gets worse.... Get it down.

Jason to Trish: *We're not going to make it back to Raglan. I've got to get it down.*

Trish (assertively): *Yes. Get it down!*

Jason thinking: *Still too high. Cows in corner. Strong cross wind. Slope looks up hill, surface looks crap, good the straps are tight. Keeping engine on but can't rely on it, don't get too far away. How is Trish doing? Gosh she looks terrified. We are in. Full flap, little bit of side slip.*

Trish (distressed): *Oh Jason, there are sheep!*

Jason thinking: *How did I miss that? Oh, they're in the long grass, damn. In the flare, dodge and try to herd them. They are following the cows, great. Pick a line and put it down. Brakes. Fence! Look for space. We are good. Stop. Breathe. Shut down....*

Jason & Trish: *High fives and hugs... Hmmm, the cows are bulls...*

Jason reflects

After calling the operator, securing the plane and contacting the farmer, who very kindly moved the bulls out so that they would not lick the plane to death, I forgot to get a photo.

After re-living this a few times I realised we had a lot to be grateful for:

- I had been scouting the area for Ag strips over the last two flights in the area.
- I had been thinking about practicing a forced landing on this flight.
- I had been working on off-field landings recently.
- As a glider pilot, I thank God for my glider instructors, the gliding club and out-landings in gliders!

The reflection also helped to highlight a number of things I would like to have done/do differently/better, and of course this experience has spurred on a big push in further rehearsing a variety of emergency procedures. To answer the question on what it was about my gliding experience that helped, there were three main things that I identified:

When you're flying around in a glider at 1000 feet, you're looking for somewhere to land and it's ingrained in you. So, when you're at 1000 feet in a power plane you're still automatically thinking, I could land there, that paddock would work, and, what way is the wind coming? When I lost power at 1000 feet, I already knew where I could get the aircraft down.

Landing out in a glider is a given. At some stage, you will need to land away from your home airfield and usually that will be in a paddock. Because it happens all the time you're taught how to do it well, and not just with the intent of walking away alive, but with your aircraft fully intact as well. You are taught significantly more advanced paddock selection and assessment techniques and you use them in almost every flight. You

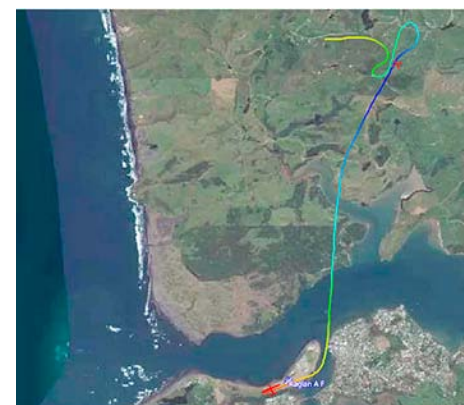
become comfortable with the idea of landing somewhere new and smaller than an airfield and it does set you up well for successfully pulling off a forced landing in a power plane.

The third thing is that to a glider pilot, a descending circuit is normal. A glider can't maintain height on the circuit. I also was current with glide approaches in the powered aircraft type I was flying, as the glide approach happened to have been my favourite non-normal approach to practise. This allowed me to be more precise with my aiming point. Typically, powered aircraft have less profile flexibility in the glide than gliders, so you still have to burn some paddock length for under shoot protection, but it is still really good to get over the fence, know you're in, and throw everything at slowing up and stopping as soon as possible. You never know what is lurking on the surface in an unfamiliar field. In this case I also found having practiced speed control transitioning in and out of a side slip, helped out as well.

I can't recommend enough that power pilots have a go at gliding, and not just to be prepared for an engine failure, but also for the pure joy of the stick and rudder flying we engage in. You also gain a huge appreciation for weather. It really is one of the most magnificent things to do in aviation.

If you'd like to have a go at gliding, check out the Gliding NZ website for details of your local club. For subscriptions to SoaringNZ, see www.mccawmedia.co.nz.

Canterbury Gliding Club will be running an ab-initio course Sunday 17th September through to Saturday 23rd September 2017 inclusive. For more information email Mark Aldridge mda@308.kiwi.nz



The track from Raglan: bow tie quite evident.



Jason and Trish Williams.

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Sybe Haakma departs Athbey Farm in his ELA gyro following the annual Autogyro Association fly-out from Dannevirke to Athol and Betty Sowry's Woodville property.

Autogyros meet at Dannevirke and at Murchison



Tony Unwin in Gyrate Tauranga's new Kallithea



Elton Haakma instructing in the MTO



New President Bruce Anderson in his Magni M24



Paul Kuchenbecker in his Dominator



Steve Pegg in the Australian built Titanium gyro



Bryan Brunton in his AirCommand

The New Zealand Autogyro Association held its annual North and South Island fly-ins at Dannevirke in January and Murchison in March. The Dannevirke event which includes an AGM enjoyed great weather and was very successful with numerous types of new and old design in attendance. Whilst equally successful in camaraderie, the Murchison event was less so regarding turn-out and flyability, due to unfortunate weather conditions for the weekend. Nonetheless, the two events showcased a rapidly growing sport and left many attendees feeling very positive about their Association's future.

Times have certainly changed in the autogyro scene. This year's annual Dannevirke gathering of the New Zealand Autogyro Association sported a million dollars worth of gyros on the flight line. 15 gyros attended, from manufacturers all over the world - including Poland, Italy, Germany, Australia, Spain, Bulgaria, USA, and New Zealand (where Autoflight are licensed to produce the Dominator design). Homebuilts were also well represented.

Some machines were trailered in but the majority flew from as far away as Mercer and Tauranga, those heading south on Friday surviving a horror ride through some Hawke's Bay turbulence - testament to the tolerance of gyros towards rough conditions.

A traditional morning tea fly-out to Athol and Betty Sowry's Athbey Farm strip was the usual success and this time included a side trip to a very well curated local motorcycle museum.

Club members report that even the dreaded AGM was a positive affair for the first time in years and the new President, Bruce Anderson, clearly announced his intention to 'encourage' members to contribute and take the organisation forward. More information about the association is at www.autogyro.org.nz

Murchison Fly-in

With weather forecasts looking problematic, consideration was briefly given to cancelling the annual Murchison event (10-12 March), then an enthusiastic decision was made to hold the event "no matter what". There were a couple of 'fly-ins' in the Friday and a few hopeful 'trailer-ins' later on as the weather deteriorated. Luckily Murchison town is only 500 metres away from the field, whereupon the weekend tended towards café and hotel patronage rather than the usual flying adventures. Those who did venture airborne during fine periods tended to return wet. Regardless, a relaxing social weekend was shared between past, present and future gyro pilots, and the weather can only be better next year.



Lloyd Heslop and RAF2000 at a wet Murchison

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Flying NZ National Championships

Just missing inclusion in the last issue of KiwiFlyer was this report on the 2017 Flying NZ National Flying Championships which were successfully held at Taumarunui towards the end of February. Thanks to Tony Hogg, David Saunders (Young Eagles report) and Peter Merwood (Scholarships report) for contributing the following:

Just when the country was holding its breath that a real summer was imminent, along came another bout of fronts to test the local organisers of the 2017 Flying NZ National Championships. It was quickly evident that weather would play an important part in how the Championships were going to be run. It ended up something like this:

Monday: Rain in Taumarunui – no arrivals. (Day had been set aside for arrivals and practice.)

Tuesday: Rain everywhere else except Taumarunui until mid afternoon – no arrivals until mid- afternoon. Planning for timetabled practices went out the window. Many of the South Island contingent had to find accommodation en route the night before.

Wednesday: Weather not bad. More arrivals. Forecast for Thursday and Friday not good so did some extra comps late on Wednesday.

Thursday: Weather not bad to begin with. Began to deteriorate in the afternoon just as we were due to do some high altitude comps (simulated forced landing). Did these at lower altitudes. Managed to cram in a lot of Friday's comps.

Friday: Rain. WX down on the deck. Postponed 8.00am competitor briefing to 11.00am. Weather lifted as predicted. Doubts about the runway being too saturated were finally allayed when we were able to get a PA-38-112 (Piper Tomahawk) off the ground both ways and the rest of the day's comps went ahead (Whew!). Indoor evening BBQ provided by Taumarunui High School. Entertainment provided.

Saturday: WX okay. Saturday's programme went ahead as planned. The rain came back not long after completion of the comps. Flying NZ Awards Dinner that night. Still raining.

Sunday: Rain. One or two false departures in the morning.

WX lifted late morning and everyone left happily and got to their destinations safely.

Despite the weather, there were of course several highlights including: Everyone flying safely with nil incidents; Radio calls -the most notable being "umm... currently west of east Taumarunui township, 1200 feet" – that got a few people curious; Toitoe being used for the landing grid fence; Hilly terrain, especially for those from flat locations; Entertainment on Friday and Saturday nights – particularly the impromptu karaoke; Awards, with particular congratulations to Canterbury Aero Club for winning the supreme award, the Wigram Cup.

Flying NZ Scholarships

One of the less well known services that Flying NZ offers its member clubs are Flying Scholarships. Over recent months, such scholarships have kick-started the flying careers of seven young people. Aside from the obvious benefit to the winners, the scholarships also assist an applicant's aero club as all scholarship funds must be channelled through the sponsoring club to support the winner's flight training activities.

The objective of the scholarships offered by Flying NZ is to provide a young person with a means to pursue their flying dreams and start their flying career. Entry criteria differ between scholarships, but generally they are open to any person between 15 and 18 years of age and provide funds that range from \$2,000 to \$3,200. Peter Merwood administers the scholarships for Flying NZ and says that the entry requirements require a moderate amount of effort to meet but should not present any difficulties to an applicant who is committed to a flying career. A 500 word essay, online aptitude test, supporting comments from a club instructor, evidence of Aviation Gateway Unit Standards and some confirmation of prior flight training are typical scholarship requirements. Scholarship applications open around August/September each year and the scholarship winners are announced in October/November with the formal presentations performed at Flying NZ Regional Rally's or the National Flying Competition.

The scholarships awarded by Flying NZ would not be possible without the generous sponsorship gratefully received from their

partners. These organisations share the same vision as Flying NZ and a commitment to grow the general aviation and sport flying sectors.

The 2017 awards and recipients were:

Nelson Aviation College - Kirk Samuel Dakers Memorial Scholarship
Sponsored by Nelson Aviation College and awarded to Liam Sutherland of North Shore Aero Club.

Flying NZ Ross Macpherson Memorial Young Eagles Flying Scholarship
Sponsored by ASPEQ, NZCAA, Airways NZ & Avsure. Awarded to Skye Davies of Tauranga Aero Club, James Bassett of North Shore Aero Club, Sarah Avery of Tauranga Aero Club and Zane Lang of Central Otago Flying Club.

ServiceIQ Gateway Flying NZ Flight Training Scholarship
Sponsored by ServiceIQ and awarded to Joel Goldthorpe of Marlborough Aero Club.

Young Eagles Programme

The Young Eagles programme at Nationals was attended by the four Ross Macpherson Scholarship winners and five other Young Eagles. Clubs represented were North Shore, Tauranga, South Canterbury and Central Otago.

The programme included lectures, videos on safe flying techniques and talks from an Air New Zealand 787 pilot and two Aerowork top dressing pilots. Aerowork brought a Cresco 750 to the airfield and the Young Eagles got to have a good look over it with one lucky participant being offered a ride in the Cresco back to the Aerowork base.

The Young Eagles visited the memorial to Nola Pickard and her husband who lost their lives whilst departing Taumarunui in 2003. Nola was a very keen supporter of the Young Eagles movement. At the end of the programme the Young Eagles sat a short exam about what they had learnt, to see who would be awarded the Nola Pickard Memorial trophy and scholarship. The winner was Liam Sutherland from the North Shore Aero Club.

In their down time, the Young Eagles got immersed in the Nationals, attending briefings, helping on the grid and meeting the country's top amateur pilots. They were also asked to make a short video of their National's experience and were divided into two teams to do this. The resulting videos were shown at the presentation dinner and were very well received.



Scholarship winner Joel Goldthorpe



Scholarship winner Skye Davies



Young Eagles lesson in progress



The landing grid fence - dayglo orange pampas plumes

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landing gear is equipped with a gas-oil damper system, providing additional comfort when on the ground, not to mention for landing.

On the inside, the Hawk's composite instrument panel has a three-dimensional shape to improve the instrument visuals - and the interior look. ZK-YAN is equipped with the new higher and aerodynamic P300 canopy, updated to offer cockpit comfort for taller pilots.

Powered by a 100 hp Rotax 912S with a variable pitch propeller, YAN cruises at around 150 mph and stalls at 41 mph. Each wing holds 40 litres of fuel for a range of 1000 km.

Logan says they brought ZK-YAN in from Australia because nobody in New Zealand is selling their used Rotax powered P300s. The aircraft is now owned by Erol and Birgit Yanar and will be based at Fernside Fields near Rangiora.

ZK-PBH R&B Bearhawk

First-time builder Graeme Pranker of Stratford says building his two-seat Bearhawk Patrol has been a huge learning curve. The Barrows Bearhawk is an American amateur-built aircraft, designed by Bob Barrows and now produced by Bearhawk Aircraft of Austin, Texas. Bob Barrow first designed a four-seater and was then encouraged to design the two-seater which is based on the Cub design but with a faster cruise speed. The kits are produced by Mark Goldberg, also of Austin, in his factory in Mexico.

DEPARTURES - January/February 2017

GDO	N.V. Vliegtuigbouw Sagitta 013	Mr R G J Smits
HBU	Eurocopter AS 350 B2	HNZ New Zealand Limited
HTH	Robinson R44 II	Helisika Agricultural Limited
HVA	McDonnell Douglas 500N	Fiordland Helicopters Limited
HVR	Robinson R22 Beta	Mr S W Gamble
JMK	Martin Aircraft P12	Martin Aircraft Company Ltd
JML	Martin Aircraft P12	Martin Aircraft Company Ltd
JPU	Pacific Aerospace 750XL	Farmers Air Limited
KNP	Pacific Aerospace 750XL	Pacific Aerospace Limited
KOZ	The Vintage Aviator BE2e-1	The Vintage Aviator Limited
LGL	Piper PA-28RT-201T	Excaltur Trust
MCG	Cessna U206G	Westland Air Charter Ltd
NCJ	Boeing 767-319	Air New Zealand Ltd
NTY	BAC BAC-167 Strikemaster Mk88	Strikemaster Limited
RSQ	Piper PA-34-220T	Roc On Aviation Limited
STR	BAC BAC-167 Strikemaster Mk88	Strikemaster Limited
TFZ	The Vintage Aviator BE2e-1	The Vintage Aviator Limited

Australia	Glider	W/d
Nelson	Helicopter	Exp
Manukau	Helicopter	Dest
Te Anau	Helicopter	Exp
Riverton	Helicopter	Dest
Christchurch	Jetpack	W/d
Gisborne	Jetpack	W/d
Christchurch	Aeroplane	Dest
Hamilton	Aeroplane	Exp
Masterton	Aeroplane	Exp
Ohope	Aeroplane	Exp
Picton	Aeroplane	Dest
Auckland	Aeroplane	Exp
Auckland	Aeroplane	Exp
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Auckland	Aeroplane	Exp
Masterton	Aeroplane	Exp

The Bearhawk Patrol is a high wing aircraft designed for comfort, endurance and fun. A generous cabin provides plenty of room for the pilot, their passenger and their gear which can be loaded through a large baggage door. Visibility is excellent both on ground and in the air. Controls are light and very responsive through the speed range and slow flight is encouraged.

Graeme's Bearhawk Patrol is powered by a 180hp O-360 Lycoming. The aircraft has a steel tube fuselage covered in fabric using the Stewart System. The wing is all-aluminium. Graeme said the kit was well made with all the welding having been completed in the factory to a very high standard. The kit comes with plans and a builder's guide but Graeme also notes there was quite a bit that was open to interpretation with many parts still to be constructed. In saying that it has only taken Graeme two years to complete the aircraft which at time of writing is nearly ready for CAA inspection.

ZK-DBA Cessna 180K



This Cessna 180K has joined the fleet of Skyfarmers Aviation Ltd in Canterbury and will be used as a run-about. Duncan Hart has always wanted a tail-dragger and since his father Don once owned one, thought it was the right time to now own one himself. Thus he found VH-WRM in Australia, and brought it to New Zealand.

Cessna 180s need no introduction to NZ aviation enthusiasts, however the K suffix denotes six seats. The aircraft is powered by a 230 hp Continental O-470 engine and cruises around 130kts. Due to its horsepower Duncan feels it is more suited to carrying four people than six. At time of writing, the aircraft has just gone through the legalities process for flight in NZ at AvTek. There are 66 180s appearing on the CAA register, 8 of those being the 180K derivative.

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