

WINGS

WINTER 2021
VOLUME 73 NO.2

SHOOTING STAR
AMERICA'S FIRST SUCCESSFUL JET

PHANTOMS IN VIETNAM
AN AUSSIE PILOT'S EXPERIENCE

MASTERY OF THE AIR
THE RAAF IN WORLD WAR II



SECRET FLIGHTS

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AIR FORCE ASSOCIATION



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MESSAGE FROM RAAF BASE TOWNSVILLE



THIS IS A SIGNIFICANT YEAR for the Air Force as we celebrate 100 years of service to our nation.

The theme of our celebration is Then, Now and Always.

In 1939, the Townsville City Council gifted the airport to Defence and in 1940 Air Base Garbutt was formed, officially known today as RAAF Base Townsville.

Our traditional custodians, the Bindal and Wulgurukaba people, also played a crucial role in the establishment of the RAAF base and it is important to acknowledge the assistance and support they provided in that process and that they continue to provide.

The air base grew quickly in the early years as the war in the Pacific intensified. At one point, there were five separate airfields in Townsville, with aircraft and maintenance hangars located all around the town. Townsville played host to the largest detachment of US aircraft outside of the United States. General MacArthur regularly flew in and out of the base.

Many of our main city roads were once runways and access points to large aircraft hangars and tarmacs.

We continue to serve and guard the north. While we acknowledge the service and sacrifice of those who came before us, we could not achieve our daily mission if not for the dedication of the 1,500 women and men of the RAAF, Army, Australian Public Service and contractors who call RAAF Base Townsville home today. All these people are a reflection of the community we serve and represent.

*Wing Commander Mat Green
Senior Australian Defence Force Officer
RAAF Base Townsville*

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MANAGER'S MESSAGE

Readers, a belated *mea culpa* to correct a few omissions and errors in the RAAF Base Wagga feature ('Home of the Airman') published in our Summer 2020 edition. SQNLDR Nigel Webster bought the errors to our attention and a close colleague also lamented our omission of the RAAF Apprentice Scheme and promised to prepare an article on the scheme for future publication (see his letter to the editor, right). A brief description of the apprentice scheme was included in the draft material but overlooked in the editorial process. We have included the promised article in this edition, turn to page 42.

Other errors in the RAAF Base Wagga feature readers may wish to note are:

- No.5 Operational Training Unit was formed on 26 October 1942 not 26 January as published.
- The network of World War II bases in the Riverina should have included Cootamundra.
- Static display aircraft at the Aviation Heritage Centre include Canberra Bomber, Macchi Trainer, Meteor, F-111C fighter/bomber and a Mirage fighter.
- Heritage Centre opening hours are Saturday to Thursday 10am-4pm; closed Fridays unless by appointment.
- Training for Airforce specialists in logistics and personnel capability management is provided through

the RAAF School of Administration and Logistics Training, not RAAF School of Technical Training as published.

We appreciate our sharp-eyed audience bringing errors and omissions to our attention and encourage all readers to contribute letters to the editor and offer suggestions for development and improvement of the magazine.

Please enjoy our latest edition.

Ron Haack

Wings magazine manager

• Please send letters to editor@raafapublications.org.au, including your name and details. Letters may be edited for length and clarity.



WAGGA APPRENTICES

Your Summer 2020 Edition of *Wings* (Volume 72 No.4) included an article on RAAF Base Wagga 'Home of the Airman'. The article detailed the early use of RAAF Wagga during World War II and post-war development, including the establishment of the RAAF School of Technical Training in 1950. However, nowhere in your article is the RAAF Apprentice Scheme mentioned. More than 5,000 aircraft apprentices trained at RAAF Wagga between 1948 and 1993 and moved on to aircraft depots and squadrons as fitters and technicians.

A couple of my apprentice mates have agreed to write a history of the RAAF Apprentice Scheme for your next *Wings* magazine. Should you run our article, your oversight will be forgiven.

Harry Howard, Cowra, NSW
(No.19 apprentice intake)



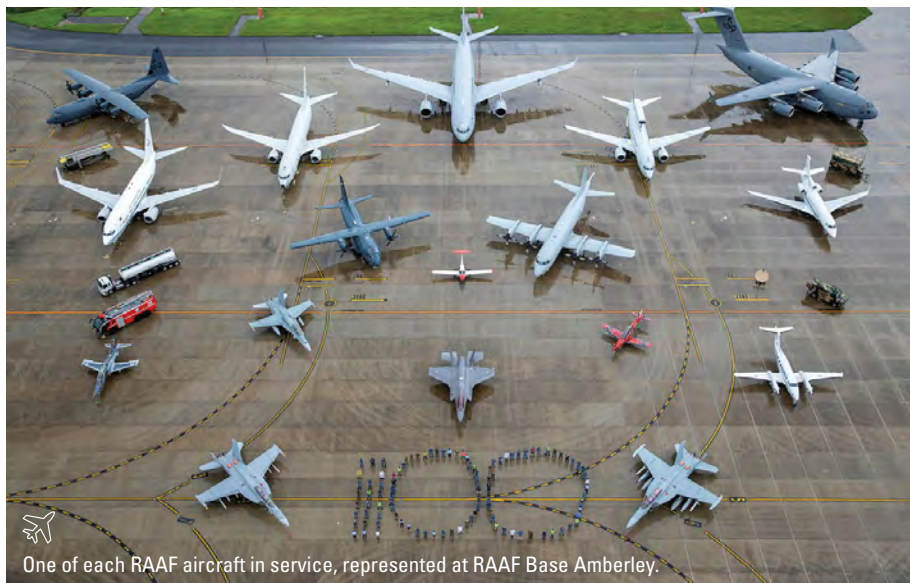
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SERVING THOSE WHO SERVE



EDITED BY Bob Treloar



One of each RAAF aircraft in service, represented at RAAF Base Amberley.

Centenary COMMEMORATIONS

ON 31 MARCH, the Air Force celebrated its centenary. The milestone was marked with a range of events at bases around the country and a ceremonial parade on the grounds of Government House in Canberra to present a new Queens Colour in company with all the individual unit colours and banners. Other events included flag-raising ceremonies, a last post ceremony at the Australian War Memorial and a commemorative service at the Air Force Memorial, all recognising the contribution, achievement and sacrifice made by RAAF personnel over the past 100 years.

Canberra was treated to a flypast of more than 60 aircraft, including Super Hornets, C-130J Hercules transports, Black Hawk helicopters, vintage Spitfire and Boomerang fighter aircraft, a Canberra bomber, a RAN Sea Hawk that flew the RAAF Ensign, a Lockheed Hudson, the only one of its kind still flying, and a Catalina amphibian long-range maritime patrol aircraft. Among the oldest was the Spitfire, a single-seat fighter used by the RAAF during World War II in northern



Australia and the islands.

The event was an opportunity for the RAAF to remember the more than 11,000 personnel who lost their lives in service, while paying tribute to more than 350,000 personnel who have served in peace and multiple conflicts since 1921.

Source: The Strategist



ABOVE The Roulettes performed a Centenary display over Canberra. Photo: SGT Oliver Carter.



RIGHT The new Queen's Colour paraded with all the current Air Force colours, standards and banners outside Government House, Canberra. Photo: CPL Craig Barrett.

ROYAL VISIT

QUEEN ELIZABETH

COMMEMORATED the 100th anniversary of the Air Force by visiting the Commonwealth War Grave Commission Air Forces Memorial at Runnymede, Surrey, UK.

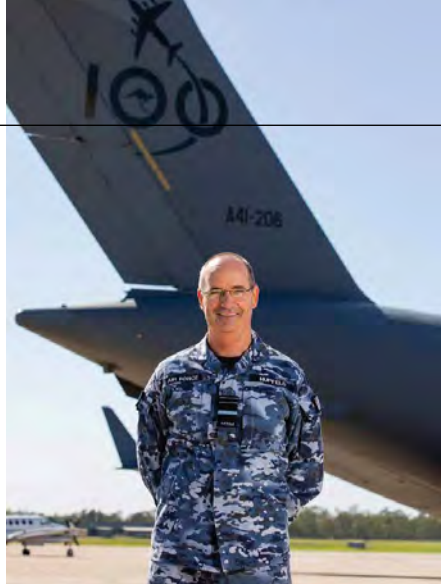
A wreath was laid on the Queen's behalf, followed by a viewing of displays in honour of the Australian airmen who gave their lives in the two World Wars and a meeting with RAAF personnel. The Queen acknowledged RAAF's contributions over the past 100 years, including the loss of 3,486 Australians who died fighting in the skies over Europe during World War II.

In a formal statement, she said she was delighted to congratulate the RAAF.

"As one of the oldest Air Forces in the world, it is fitting to pay tribute to the efficiency, skill and sacrifice of the men and women who have served in its ranks, in Australia and overseas, during the past one hundred years," she said. "Throughout my reign, the Royal Australian Air Force has shown immense dedication to duty and defended our freedom in many conflicts around the world."

The Runnymede memorial commemorates the more than 20,000 Commonwealth airmen and airwomen who died on operations during WWI and WWII and have no known grave, including more than 1,300 members of the RAAF. Queen Elizabeth officially opened the memorial in 1953, not long after her coronation.





CAF's message

TO LEAD THE RAAF at such an important time is both very humbling, and an honour. Everyone involved has done such an amazing job pulling it together. I look forward to being involved and playing my part in honouring those that have come before us – and especially those who gave their lives in service.

I'm really pleased we're taking the opportunity to recognise the important contributions our people are making today, and working to inspire the next generation's interest in Air Force, and aviation more broadly.

Veterans don't realise how special they are. When you talk to them, they're so humble about their contributions – they think they are just ordinary people. And they are, but the things they did were extraordinary. I expect that as

usual, they won't want a fuss made over them, but it's important we remember and remind ourselves what they have done for our country.

Culture is something I am passionate about and I cannot understate how important culture is to our success. We understand the nature of the strategic environment, and we understand how we must prepare ourselves to meet the challenges that we face.

We know that we need to ready ourselves with a renewed focus on purpose, and particularly to ensure our culture and our strategy are indivisible. Without the right culture, strategy becomes un-pursuable. Without the right strategy, culture becomes short-sighted.

This is not about forgetting our past or dismissing who we are. This will leverage all the strengths and power of our history and its legacy and will cement our identity.

As an organisation (and as a society),

we need to consistently do more at every level to ensure that our workforce is physically, emotionally, psychologically and ethically safe.

This will require leadership and accountability at every level and from every person to stop actions that bring our personnel harm. Our Air Force needs our people to be always at their best – and in every place. Through these continued cultural efforts, we will all ensure Air Force is a service in which we can thrive and deliver what our nation requires.

We've called this plan Our Air Force, Our Culture.

Our Air Force, Our Culture will deliver throughout our centenary year clarity on our purpose, our values and our identity through key documents and insights, culminating in the release of the Air Force Culture Companion later in the year.

Air Marshal Mel Hupfeld, AO, DSC

RAAF 'AIRMEN' BECOME 'AVIATORS'

AIR FORCE IS REPLACING the term "airman" with "aviator". Chief of Air Force Air Marshal Mel Hupfeld announced the change at a centenary dinner, saying he wanted to instil a "stronger sense of identity" among the ranks.

"Of all the work that has been done in developing our Air Force culture, the most challenging dilemma has been fully explaining who we are," AIRMSHL Hupfeld said. "We understand well enough what we are and what we do – but have never quite managed to successfully articulate who we are. We are all aviators."

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ISR IN AN UNSTABLE WORLD



 P-8A Poseidon.

AUSTRALIA'S INTEGRATED INVESTMENT PROGRAM has earmarked \$195 billion for Intelligence, surveillance and reconnaissance (ISR) to meet the strategic needs outlined in the Defence White Paper to 2025 and maintain a commitment to the Indo-Pacific. ISR will monitor threats and, if necessary, undertake military engagements on Australia's terms.

A stable feature of Australia and our allies' ISR capabilities, the P-8A Poseidon possess an Advance

Airborne Sensor which allows it to undertake 360-degree target identification and maintain tactical awareness, radio jamming and cyber warfare capabilities, as well as the capacity to trace the source of radio transmissions.

Australia has also procured four customised Gulfstream G550 aircraft which possess electronic warfare capabilities and will provide a link between air force, maritime and land assets.

Drones improve SURVEILLANCE CAPABILITY

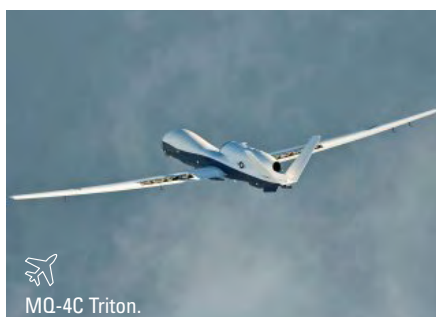
RAAF TRITON DRONES will patrol the Pacific and strengthen collaboration with the United States and Japan.

The MQ-4C Triton, a development program between the RAAF and US Navy (USN), is engineered with special long-range sensors intended for ocean surveillance and can cover more than one million square miles in a single mission.

A key element of the program is the integration between Triton and the

USN and RAAF sub-hunting Poseidon aircraft, which can receive cues from a long-range, roaming Triton regarding areas of interest or concern picked up by its on-board electronic and optical sensors. Disturbances on the surface, or radar returns from surface ships could alert a Poseidon of suspicious or concerning activity.

Source: The National Interest



 MQ-4C Triton.



RAAF space COMMAND

THE RAAF PLANS to set up a space command from next year in the wake of similar initiatives in the US and China.

Chief of Air Force, Air Marshal Mel Hupfeld said it would be an integrated grouping drawing on the expertise from other Australian Defence Force elements, organised to generate, sustain and operate space capabilities.

Air Marshal Hupfeld said Australia was about four years behind on the defence space initiative but was catching up to its Western peers. "Space is a war-fighting domain but we're not going to militarise space," he said.

Source: Brinkwire



ABOVE Parkes radio telescope.

Williamtown runway extension

IN FEBRUARY, Minister for Defence Linda Reynolds announced that the Department of Defence would fully fund the Defence component of the RAAF Williamtown runway upgrade to Code E status to enable wide-bodied, long-haul aircraft to access the airport.

The Newcastle Airport component of the project is expected to cost about \$65 million in addition to the \$115 million upgrade that Defence is undertaking.

The upgraded runway will meet Defence's capability needs and will improve access for international tourism and international freight.

Source: News of the Area



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MAJOR GROWLER UPGRADE

BOEING HAS COMMENCED a mission system upgrade for the US Navy's fleet of EA-18G Growler electronic warfare aircraft. Growlers play a major role in jamming radar and communications signals of threat forces, disabling the enemy forces' ability to detect and track opposing military forces.

Boeing said the upgraded aircraft would be designated Growler Block II and include features such as the advanced cockpit system and conformal fuel tanks, as well as improved sensors and an upgraded electronic attack package. The upgrade will enhance the Growler's ability to transfer data more rapidly to other aircraft and platforms.

Overall, 160 Growlers are expected to be upgraded over five years, with full rate work to commence in June 2021. The RAAF is the only Growler operator outside the US with 11 aircraft – a 12th was lost in a January 2021 engine failure related fire.

Source: Flight Global



RAAF EA-18G Growler

\$1.8m raised for suicide prevention

SOLDIER ON'S MARCH ON CHALLENGE has raised more than \$1.8 million to prevent veteran suicide.

During the month of March, the March On Challenge called on Australians to walk 96km, the length of the Kokoda Track, to raise money to help prevent veteran suicide. The challenge attracted more than 6,200 participants, 862 teams and 27 schools – with a combined total of more than 434,000km walked.

Soldier On CEO Ivan Slavich said he was astonished by the support. "We have seen participants around the world completing their challenge through day-to-day activities, group walks, one-day challenges, mountain hikes, and even walks across the ocean floor," he said.

March On Patron, 102-year-old retired Sergeant Bert Le-Merton, said the success of the campaign was extraordinary. "The funds raised through March On will allow Soldier On to provide serving and ex-serving veterans and their families with the assistance they need to build better futures following their service," Sergeant Bert said.

Australian Defence Force extends satellite agreement with Inmarsat

THE AUSTRALIAN DEFENCE

FORCE has renewed a contract with British satellite provider Inmarsat, broadening the agreement's scope to include managed services. The deal extension to 2027, totalling \$291 million came a month after the United Kingdom and Australia decided to boost technology sharing and investment in their respective space industries.

"Inmarsat has sponsored ADF satellite communications needs at home and abroad for over 30 years," said Brigadier Gregory Novak, commander of the ADF's Defence Strategic Communications Division. According to Inmarsat, the partnership has expanded to cover the company's whole portfolio of controlled services. ADF will use its Operational Monitoring and Control System to digitally map and distribute bandwidth throughout the fleet in real time.

The agreement follows the signing of a 'space bridge' arrangement between the UK and Australia to increase connections to commerce, investment and academic study opportunities. The "world's first" space bridge alliance, according to UK Science Minister Amanda Solloway, is another move toward the nation's goal of being a "worldwide efficient space power". By 2030, the UK expects the industry to produce 30,000 new workers and Australia plans to recruit 20,000 additional workers in the space industry over the next five years.

Source: Test & Measurement News



Airman of the year 2020

A COMMUNICATION ELECTRONIC TECHNICIAN from No.114 Mobile Control and Reporting Unit, Corporal Daniel Loane, has been named the Air Force Airman of the Year for 2020 and was awarded the Air Vice Marshal B.A. Eaton trophy.

The Air Vice Marshal B.A. Eaton Airman of the Year Award is presented to an airman ranked corporal or below for their contribution to the community.

CPL Loane won the prestigious award for his response to a civilian vehicle accident while deployed as Joint Task



Unit 629.7.2 detachment commander near the remote Northern Territory checkpoint.

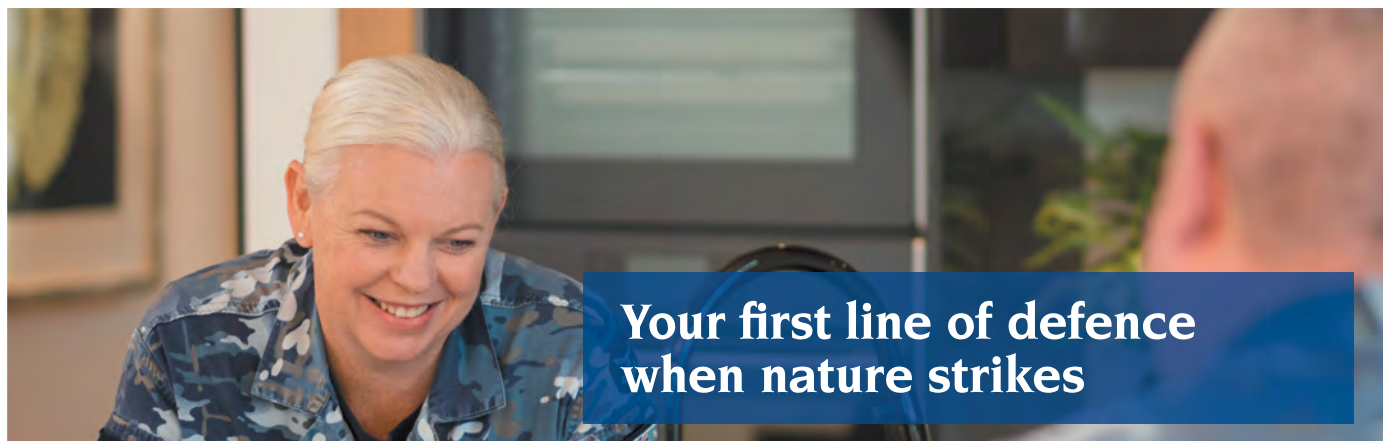
He also set an exceptional standard throughout 2020 and, with a significantly reduced team, maintained the section output while fostering exceptional rapport with the operations team.

CPL Loane joined the Air Force in 2011 and is normally based at RAAF Base Darwin as the 114MCRU maintenance manager within the tactical air defence system section.

Source: Australian Aviation



ABOVE CPL Loane. Photo: SGT Pete Gammie.



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PRESIDENT'S DESK

A CENTURY IS just over a lifetime. It's amazing to reflect on the achievements of Air Force over that time. Air Force 2021 celebrations in Canberra certainly helped refresh our memories of past and present accomplishments.

A 61-aircraft flypast, including vintage and contemporary aircraft, the presentation of the third Queen's Colour for the Royal Australian Air Force by the Governor General His Excellency General the Honourable David Hurley AC DSC (Ret'd) and addresses by Chief of Air Force Air Marshal Mel Hupfeld AO DSC and other dignitaries reflected on our ability to adapt technically and culturally to the service it is today. I'm sure all Air Force veterans are very proud of their service's achievements.

I was proud to represent the Association at the celebratory functions in Canberra, including the centenary dinner on the evening of 31 March, when I presented the Air Force Association Trophy to Headquarters Air Force Training Group – Winner for 2021, for its stellar performance throughout 2020 amid the challenging COVID restrictions. Also notable was the announcement by Air Marshal Hupfeld of the Air Force Association's \$20,000 contribution to the cost of the Sir

Richard Williams sculpture to be situated at Moonta, South Australia, Sir Richard's birthplace. The contribution matches the South Australia Government's donation towards the cost.

Sharon Bown, National Vice-President, and I laid wreaths at the Australian War Memorial's Last Post Ceremony on 30 and 31 March. Air Marshal Hupfeld and Deputy Chief of Air Force Air Vice-Marshal Stephen Meredith AM DSM also attended and laid wreaths on separate occasions.

Several of the Association's divisions also held celebratory events, many of which I attended. The significance of the Air Force's milestone and the opportunity for veterans to re-engage following a year of COVID-induced social restrictions was obvious from listening and watching the interactions.

The Association congratulates Air Commodore Andrew Elfverson, his Air Force 2021 team and the many other servicemen and women involved in the planning and execution of the events over 30-31 March. It had been a challenging year to organise such an event with the ever-changing health restrictions across Australia, including the eleventh-hour COVID breakout in Queensland that had the



ABOVE Air Marshal Hupfeld with Mrs Louise Hupfeld laying a wreath at the Last Post Ceremony at the Australian War Memorial. Photo: SGT Oliver Carter.

potential to impact the ceremonies. Unfortunately, the outbreak precluded many Queensland veterans and their families from travelling to Canberra for the occasion.

The Association is looking forward to other Air Force 2021 events later this year, including the unveiling of an Air Force Memorial sculpture to be situated at the southern end of the Main Parade Ground at RAAF Base, Point Cook, Victoria. The date for the event is expected to coincide with the Avalon International Air Show 2021.

It is a big year for Air Force and the Air Force Association.

THEN - NOW – ALWAYS

*Carl Schiller, OAM, CSM
National President*

National Awards - call for nominations

Nominations for the Association's premier annual awards are now open. The awards – the Brian & Nora O'Connor Award and the Geoff Michael Award – exist to recognise outstanding or exceptional service, not merely long service in one or more roles. Consequently, they are not necessarily awarded every year, either because no nominations were received or those submitted did not meet the high standards of service required.

The Brian & Nora O'Connor Award is for an organisation that has rendered "outstanding" service to the Association, a division or a branch, in the preceding calendar year or over a number of years.

The Geoff Michael Award is for an individual who has rendered

exemplary service to the Association and contributed to the enhancement of its public reputation and recognition.

Nominations require a proposer and seconder, and must be endorsed by the division in which the nominee resides (if an individual) or is located (if an entity), and must address all criteria on the nomination form.

Nominations for the 2021 Awards are now open and will be received until 5pm, Australian Eastern Daylight Time, on Friday, 10 September 2021. Nomination forms, in paper or digital format, may be requested from the National Secretary, by telephoning (03) 9813-4600 or by email to natsec@raafa.org.au.

Townsville CENTENARY CELEBRATIONS

IN EARLY APRIL, the Townsville Branch of the RAAF Association, Queensland Division, organised two events to celebrate the RAAF centenary.

On Friday, 9 April the branch hosted 70 guests at a commemorative dinner at the Rydges Southbank Townsville event centre. Invited dignitaries included WOFF-AF Fiona Grasby OAM, Warrant Officer of the Air Force representing CAF, Group Captain Carl Schiller (ret'd) OAM CSM, National President of the Air Force Association, AIRCDRE Tony Jones, Patron of the Townsville Branch, Ted Mildren CSM, Queensland Division President, WGCDR Mat Green, Senior ADF Officer RAAF Townsville, and Councillor Jenny Hill, Mayor of Townsville. Representatives

from local ex-service organisations and members of the Townsville Branch also enjoyed the festivities.

Following a sumptuous meal, guests were addressed by both WOFF-AF and the National President. WOFF-AF Grasby offered an inspiring insight into the significance of the past century to RAAF personnel and the nation and the commitment to carry on the exemplary efforts made "Then-Now-Always" in service to Australia and others. Carl Schiller followed with a complimentary exposé of the origins of the RAAF and the role that we, as an association, can play in support of veterans.

A jazz ensemble from the band of the 1st Battalion, the Royal Australian Regiment performed several sets.

The following day, a non-denominational service was held at the Sacred Heart Cathedral in Townsville. The service was led by the Townsville Branch Chaplain, Rev Dr Wayne Melrose OAM supported by The Most Rev Tim Harris, Bishop of Townsville, and RAAF Base Townsville personnel.

The Australian flag, RAAF Ensign and

the Association flag were marched in and mounted for display throughout. WGCDR Mat Green, BRIG Kahlil Fegan DSC, WOFF-AF Grasby and Trevor Beams (Branch President) laid wreaths in memory of fallen comrades.

WOFF-AF presented the first reading and Carl Schiller the second. Ted Mildren recited the ODE which was followed by the *Last Post and Rouse*. The congregation paid respect to the life of Prince Phillip, Marshall of the RAAF, with a minute's silence.

**Basil Nelson, Secretary,
RAAF Association Townsville Branch.**



BELOW Cpl Arthur Florence and the jazz ensemble.



AFA NSW AGM DELEGATES ARRIVE IN STYLE



Ron Glew (left) with Caribou Captain Dick Elliott, Newcastle Airport CEO Peter Cock and Captain Doug Haywood. Photo: courtesy Kerry Ross, Fighter World.

A RARE AND SOMEWHAT nostalgic sight greeted staff and passengers on the morning of 12 May when the Newcastle Airport terminal welcomed the arrival of a retired RAAF DHC-4 Caribou.

Now registered as VH-VBA, the former A4-210 Caribou is one of two owned and operated by the Historical Aircraft Restoration Society (HARS) based at Albion Park near Wollongong, NSW. Its mission on this occasion was to enable members of the HARS Branch of the NSW Division, accompanied by NSW Division President Ron Glew, to arrive in style to attend the AGM in Newcastle over the 12 and 13 of May. Ron served as an assistant loadmaster on Caribou aircraft with RAAF Transport Flight Vietnam based at Vung Tau, 1965-66.

Complementary support for aircraft and passengers was generously provided by Newcastle Airport. The airport enjoys an excellent working relationship with the air base, is a strong supporter of the local Port Stephens community and the ADF, and is a major sponsor of *Wings* magazine.



Warrant Officer Ivan Petrovic of No.22 Squadron places the Memorial Book into a display case at the RUSI Library. CPL Dan Pinhorn.

TRIPLE COMMEMORATION

AIR FORCE ASSOCIATION NSW in partnership with the Anzac Memorial Trust held a ceremony on 26 March 2021 to commemorate the RAAF centenary, the 101st birthday of the Association and to place the NSW Memorial Book into the custodianship of the Royal United Services Institute (RUSI) Library within the ANZAC Memorial, Hyde Park, Sydney.

Her Excellency, the Honourable Margaret Beazley AC, QC, along with veterans from World War II, Korea, Malaysia, Vietnam and other conflicts, state MPs and other VIPs attended the service. AVM Joe Iervasi AM CSC Air Commander Australia was the guest speaker.

The Governor honoured the Association by wearing her Honorary RAAF Air Commodore uniform and was particularly interested in the Memorial Book as a close relative, Alan Osbourne Beazley of 466 Squadron, is listed. Alan, an Air Gunner, was aged 19 when his Halifax collided with another 466 Squadron aircraft on 24/25 July 1944. Only one crew member of either aircraft survived, Keith Campbell who

was a NSW Association member until his recent last flight.

The ceremony commenced when the Memorial Book was entrusted to an armed Air Force guard and ceremonially escorted to the forecourt of the Anzac Memorial where it was prominently displayed until ceremony completion.

At 1050hrs, the gathering was treated to a formation flypast by four RAAF PC-21 aircraft from No.4 Squadron Williamtown as the Memorial Book arrived at the Anzac Memorial. Later, a stream of vintage aircraft from the Historical Aircraft Restoration Society, a branch of the NSW Division, comprising an Orion, Neptune, Caribou, DC-3 Dakota and the "Black Cat" Catalina overflew the ceremony.

On conclusion of the ceremony, the Memorial Book was escorted into the RUSI Library, reconsecrated by Air Force chaplains and formally entrusted to the care and custodianship of the library.

The historic Memorial Book, titled *They Gave Their Lives*, lists the names of the 3,978 RAAF personnel who enlisted in NSW and who

made the ultimate sacrifice during World War II. It was commissioned by Wing Commander Nigel Love, one of the original members of the Australian Flying Corps and the post-War President of the Air Force Association (NSW).

Eric Roberts, a 69-year-old calligrapher, spent five months illuminating the names of the fallen in gold and four vibrant colours using hand-cut bamboo pens on handmade parchment. The book is 460 pages long, with the names of the fallen written on 365 pages; one page per year. Weighing 8kg, the book was flown to London for binding using Moroccan leather, silk and gold-leaf embossing.

Her Majesty Queen Elizabeth II and His Royal Highness Prince Phillip unveiled the book at St Andrews Cathedral in Sydney on 7 February 1954 during their first Australia tour. From that time an armed RAAF escort and an officer would parade at the cathedral every morning and turn a page to honour and remember the names of the fallen.

The Memorial Book was kept at St Andrews Cathedral until 1966, when it was moved to the RAAF Association Museum in Clarence Street, Sydney where it was placed in front of stained-glass windows, and a second less ornate but still magnificent duplicate was then placed into St Andrew's Cathedral.

The Memorial Book was then held in the Air Force Association (NSW) Library before embarking on an uncharted history. It was rediscovered in the Association's care a few years ago.

As part of the RAAF centenary celebrations, the decision was made to induct it into the custodianship of the RUSI Library, to be displayed to the public in perpetuity.

The duplicate book was also reconsecrated by the Dean of Sydney and RAAF Chaplains at St Andrews Cathedral after the ceremony at the Anzac Memorial, and remains in the cathedral's custodianship in a public place of prominence.



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EDITED BY John Kindler

AIRBUS HAS SIGNED a contract to provide a digital services focus for the maintenance of the Air Refueling Boom System (ARBS) on the RAAF KC-30A Multi-Role Tanker Transport (A330 MRTT) fleet. Airbus' suite of digital services, SmartForce, is expected to reduce maintenance costs and improve fleet availability through data analytics applications enhancing the fault diagnosis and troubleshooting tasks.

The firm noted that the Central Data System would allow operators to draw on flight data captured by the Mission Recording System and recommend maintenance actions to resolve issues identified. The Central Data System is a joint development, with Northrop Grumman – the Australian KC-30A Through Life Support provider.

Group Captain Scott Parry, Officer Commanding Heavy Air Lift Systems Program Office, said: "The Central Data System delivers a significant capability benefit for the KC-30A aircraft and demonstrates the strong commitment within the KC-30A enterprise to innovation and improvement." The capability is expected to evolve to allow users to extend the ARBS analytics to entire aircraft level diagnostics.

Source: defenceconnect.com.au



Taking AI to NEW HEIGHTS

AMONG THE MYRIAD technological developments in airpower, including advanced propulsion, better stealth, directed-energy weapons and hypersonics, perhaps the most important will turn out to be artificial intelligence (AI). AI has the potential to transform air combat operations and the way airpower is conceived and used.

The US Air Force demonstrated the role of AI dramatically in December last year by flying a U-2 reconnaissance aircraft, which normally carries a single

crew member, with an AI algorithm as a 'virtual backseater'. As the pilot flew, the AI system – dubbed 'ARTUμ' in honour of Star Wars robot R2-D2 – controlled the aircraft's sensors and navigation.

On the test flight, ARTUμ was tasked with finding adversary missile launchers and was "solely responsible for sensor employment and tactical navigation", while the human pilot concentrated on finding enemy aircraft and flying. ARTUμ "made final calls on devoting the radar to missile hunting versus self-protection".

The flight demonstrated human-machine teaming at a new level and points to the potential to integrate AI backseaters into current fighters like the F-35 and future air combat aircraft such as the US Next Generation Air Dominance platform.

The F-35 has room for just one person in the cockpit, but with AI the pilot gets a backseater that can manage the complex process of integrating data from a multitude of onboard and offboard sensors and other information sources, freeing up the pilot to fly and fight. AI can also manage human-machine teaming between the F-35 and autonomous systems, such as the Loyal Wingman autonomous platform being developed in Australia as part of the Boeing airpower teaming system.

AI dramatically reduces the aircrew's workload and can process data and information faster than a human pilot, and rapidly assess threats. But it also boosts the operational potential of autonomous platforms in crewed-uncrewed teaming because it can ensure greater oversight and control – 'on the loop' for the autonomous platform – while giving the human pilot the big picture of tactical operations. That eases rules-of-engagement constraints on autonomous system employment.

A complementary next-generation air combat system spread across multiple platforms and technologies – crewed and autonomous – that has AI as a key component needs to be prioritised as an opportunity for common development with the Five Eyes

partners, especially the US.

The Australian Defence Force could work with its US counterparts, or with allies and partners in Europe and Japan, to develop future air combat capabilities that will complement and, ultimately, replace the F-35 sooner than the 2040s. Boeing's Loyal Wingman drone is a good first step and may be able to be evolved into a potent future air combat capability.

It's time for the RAAF to be forward-looking and proactive in accelerating the acquisition of the next generation of air combat capabilities. That effort should incorporate the broad application of AI – inside the cockpit and across the battlespace – to allow our military to think and act at machine speed.

Of course, there are risks in moving fast. AI is still a relatively new technology, and its complexity needs to be mastered. Networking a multitude of offboard sensors that an AI algorithm can use to inform aircrew of the common operating picture will require significant investment in software development, supported by the establishment of research facilities and the training of personnel. It will require a substantial boost in digital high-speed communications bandwidth. That's likely to require investment in other technology areas – notably, satellite-based laser-optical communications and quantum technologies.

The ADF cannot expect to operate in an uncontested electromagnetic domain. Potential adversaries such as China are already developing sophisticated capabilities in electronic and network warfare, so our tactical command and control, including elements controlled by an AI backseater, must be robust and resilient.

Meeting all of those challenges will take time, money and skilled personnel. The USAF U-2 demonstration of ARTUμ is one step down a path towards tomorrow's airpower, and Australia needs to proceed with determination.

*Malcolm Davis, senior analyst,
Australian Strategic Policy Institute
Source: The Strategist*



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BAESA Williamtown INDUCTS F-35A

BAE SYSTEMS AUSTRALIA'S (BAESA) Williamtown facility has inducted the first F-35A Joint Strike Fighter aircraft into a local maintenance program, a major milestone in the \$65 billion defence program.

Prime Minister Scott Morrison, Defence Minister Linda Reynolds, Defence Industry Minister Melissa Price, Chief of Air Force, Air Marshal Mel Hupfeld and BAE Systems Australia CEO Gabby Costigan attended an event to officially welcome the fifth-generation fighter into the facility.

The PM said: "This is about protecting and securing Australia's interests but it's also creating jobs and driving investment right here in the Hunter and across the

country, too. This induction demonstrates the world-leading capability of our local defence industry here in Australia.

"We want to give as many opportunities to Australian companies as possible, which is why there's already more than 50 local companies sharing in \$2.7 billion worth of contracts as part of the F-35 program."

BAESA's Williamtown facility was selected to support the aircraft for the next 30 years. As the Southern Pacific Regional F-35 Heavy Airframe Depot, it will initially provide airframe maintenance and sustainment with a team of 32 F-35 technicians.

Source: airforce-technology.com



Defence issues latest SICP grants

THREE MANUFACTURING BUSINESSES have been approved for grant funding, totalling more than \$2 million, in the latest round of the Federal Government's Sovereign Industrial Capability Priority (SICP) program.

The grants were awarded to South Australia-based businesses Axiom Precision Manufacturing and M&I Samaras, and NSW-based business Jehbco Manufacturing.

Axiom, which has secured its second grant under the scheme, has been awarded \$1 million to develop the capability to weld high-precision structures and armoured steel. The firm contributed to Australia's COVID-19 response, producing face shields for health and aged-care workers, and has recently signed a contract for component supply for the Joint Strike Fighter Program.

M&I Samaras' grant, also valued at \$1 million, is expected to be used to fund the development and installation of a robotic assembly and welding line, designed for heavy engineering and equipped with advanced manufacturing capabilities required in the shipbuilding process.

Jehbco Manufacturing has been awarded \$92,340 to fund the purchase and commission of capital equipment, as well as upgrades to overall security, which is expected to facilitate productivity gains and improve quality and precision.

The firms are the latest of 73 Australian small and medium businesses to secure a combined \$40 million in grants under the SICP program since its launch in November 2018.

Source: defenceconnect.com.au

AME Systems gains Northrop Grumman Certification

ARARAT-BASED AME SYSTEMS has gained certification to produce wire harnesses for the MQ-4C Triton and deliver products to Northrop Grumman as part of its ongoing engagement with the RAAF. It is one of only three global companies with the certification.

AME Systems managing director Nick Carthew said the company is "extremely proud" to be partnering with Northrop Grumman, and Northrop Grumman Australia chief executive Chris Deeble noted that growing Australia's sovereign capacity was one of Northrop Grumman's key objectives.

Source: defenceconnect.com.au





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Collins wins US recon pod contract

RAYTHEON TECHNOLOGIES UNIT

Collins Aerospace has received an indefinite-delivery, indefinite-quantity (IDIQ) modification contract from the US Air Force for its new Fast-Jet reconnaissance pod, dubbed 'MS-110 Multispectral Airborne Reconnaissance system'.

The newer MS-110 sensor provides wide-area coverage in high resolution and advanced multispectral imagery to detect targets with a higher degree of confidence even in poor weather conditions. Image quality enables flexible planning/re-tasking by aircrew in response to real-time changes in dynamic situations. The sensor comes with a Sci-Toolset, a software suite that helps end users extract critical intelligence from the MS-110's imagery.

Source: airforce-technology.com



ABOVE The MS-110 sensor provides advanced multispectral imagery to detect targets with a higher degree of confidence. Photo: Collins Aerospace.



Loyal Wingman prototype.

First test for Australian AIR COMBAT DRONE

BOEING'S LOYAL WINGMAN'S first flight was completed on 27 February at the Woomera Range Complex, South Australia.

The Loyal Wingman, the first military drone to be designed in Australia, was developed by US manufacturer Boeing in conjunction with the Defence Department and the RAAF. Its primary mission is expected to be electronic warfare and reconnaissance, particularly in environments considered too risky for crewed aircraft, although the ultimate objective is to team the platform to work in formation with traditional crewed aircraft such as the F-35 Joint Strike Fighter.

The drone, roughly the size of a traditional jet fighter, has a range of 3,700km and uses Artificial Intelligence to process on and off-board sensor data to resolve targeting solutions.

"The Loyal Wingman's first flight is a major step in this long-term, significant project for the Air Force and Boeing Australia, and we're thrilled to be a part

of the successful test," said Air-Vice Marshal Cath Roberts, the RAAF's Head of Capability. "The Loyal Wingman project is a pathfinder for the integration of autonomous systems and artificial intelligence to create smart human-machine teams."

The successful flight coincides with an additional \$115 million in government investment in the Loyal Wingman program, on top of the \$40 million which had already been committed. The RAAF plans to buy three drones, which Boeing calls the Airpower Teaming System, as part of the Loyal Wingman Advanced Development Program.

A working prototype of the combat drone was unveiled last year but planned test flights in December were pushed back due to COVID-19 border restrictions and unfavourable weather conditions.

Boeing says additional Loyal Wingman aircraft are currently under development, with plans for more test flights alongside crewed jets scheduled for later this year.

Source: msn.com



Cyber contracts for Leidos, KBR & Fujitsu

DEPARTMENT OF DEFENCE has awarded contracts to Leidos, KBR and Fujitsu, as part of a \$175 million program to upgrade Defence's information, communication, technology (ICT) infrastructure. The ICT network provides key command, control, situational awareness and allied/partner interoperability services for ADF personnel across all battlespace domains.

Specifically, the firms have been tasked with working collaboratively to provide: service desk functions; end-user and workstation support; voice over internet protocol (VoIP) and email communications; collaboration tools; and network infrastructure and network services management.

Source: cybersecurityconnect.com.au

BOEING BEGINS RED HAWK PRODUCTION



BOEING HAS COMMENCED

production of the US Air Force (USAF) T-7A Red Hawk advanced jet trainer, with the first US-built portion of the trainer officially entering the company's production line.

Part of an advanced pilot training system offered by Boeing in partnership with Saab, the aircraft was fully designed using 3D model-based definition and data-management systems. The project employed Boeing T-X aircraft digital engineering and design processes, and the training system incorporates advanced ground-based live and virtual simulators.

In 2018, the USAF awarded Boeing a \$US9.2 billion contract to supply 351 advanced trainer aircraft and 46 ground-based training simulators associated with the aircraft. Saab provides the aft fuselage of the jet.

Source: airforce-technology.com



LEFT Boeing T-X trainers. Photo: Secretary of the Air Force Public Affairs.

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A GLOBAL WAR



LEFT A P-40 Kittyhawk fighter-bomber of No.3 SQN in Italy, 1943.

IN OUR SECOND
INSTALLMENT ON
THE HISTORY OF THE
RAAF, WE RELATE
IT'S CONTRIBUTION
TO WORLD WAR II
WITH EXCERPTS
FROM THE RAAF
PUBLICATION
*THE AUSTRALIAN
EXPERIENCE OF
AIR POWER.*

PHOTOS Courtesy
of the Australian War
Memorial.

EUROPE, NORTH AFRICA AND THE MIDDLE EAST

THE RAAF WAS UNPREPARED

when Britain declared war against Germany on 3 September 1939. It lacked both modern aircraft and sufficient personnel to send a meaningful expeditionary force. Indeed, Britain would need to supply the machines and other necessary equipment for any RAAF commitment.

Britain proposed a scheme for its dominions, Canada, Australia and New Zealand to create a vast pool of trained aircrew from which the Royal Air Force (RAF) could replenish its losses. Australia's Minister for Defence realised, as World War I had shown, that "victory in the war will depend on mastery of the air" and the Australian Government accepted the proposal. The decisive factor would be the ability to sustain

air power in the face of heavy losses of aircraft and crew. Replacing aircraft was difficult enough but ensuring a plentiful supply of trained manpower was even more complex. The British proposal now required a commitment of personnel far greater than the few hundred airmen originally envisaged in the Australian expeditionary air force contingent.

Details of the Empire Air Training Scheme (EATS) were negotiated at a conference held in the Canadian capital, Ottawa, and embodied in a formal agreement signed in December 1939. Under its provisions, airmen from the dominion nations would receive basic training at home before undertaking advanced courses in Canada or Rhodesia, and operational conversion and service with the RAF. Australia's commitment was to provide, over three years, basic training to 978 aircrew every four weeks (later increased to 1,147). The scheme was extended in 1943, so that ultimately over 38,000 young Australians completed basic training at home.

SCALE OF EXPANSION

At the start of WWII, the RAAF had only 27 flying instructors and 200 aircraft. Meeting its EATS commitment required a seven-fold increase in aircraft strength and an 11-fold increase in manpower. It established more than 40 schools in flying, air navigation, bombing and gunnery, and technical training for ground staff. Many establishments involved construction of an airfield. By the end of 1940, the first Australians in the EATS had gained their 'wings'. Three-quarters of them went overseas to fight German and Italian forces and distinguished themselves in every major campaign from Britain to Russia and the Middle East.

The RAAF's role under the scheme, originally valued only as a training organisation, has been described as "an extraordinary achievement which laid the foundations for Australia's single most important contribution to victory in Europe and, therefore, in World War II".

LIMITED NATIONAL IDENTITY

Article XV of the EATS agreement allowed for the dominions to operate squadrons of their own air forces. Under that provision, once the proportion of aircrew in a squadron reached 75 per cent Australian, it would become an RAAF unit.

The first Article XV squadrons were formed in England in 1941 and eventually 17 RAAF squadrons, numbered 450 to 467 (excluding No.465 which was not formed), were operational. The aim was to reassure Australia that its personnel fighting overseas would retain their national identity. In reality, that aspiration became largely untenable, as Britain's Air Ministry decided where personnel were posted and sending RAAF personnel exclusively to RAAF squadrons was not considered a high priority. The result was a mix of nationalities within each dominion's Article XV squadrons.

Three additional domestic units were drawn from the RAAF for active service outside the Asia-Pacific region: No.10 Squadron, already in England taking delivery of new Sunderland flying boats when war began; No.3 Squadron, an army cooperation unit sent to support the AIF in the Middle East in 1940; and No.1 Air Ambulance Unit, also sent to the Middle East at the end of 1941. No.10 Squadron was the first RAAF unit to go to war.

BATTLE OF BRITAIN, 1940

In the summer of 1940, Australian pilots, many of whom had transferred to the RAF while on secondment from

the pre-war RAAF, were among 'the few' who fought the Battle of Britain, defending England against massive air attacks by the Luftwaffe and thwarting Germany's invasion plans. The efficient employment of a small defending force, concentrated where and when it was most needed, was crucial to the battle's success. That tactic was made possible by the development of radar and its integration into a complex network of communications and control centres.

Of the 1,495 RAF Fighter Command pilots who defended Britain in the air between 10 July and the end of October 1940, some 30 were Australian, 14 of whom were killed in action.

NORTH AFRICA AND THE MEDITERRANEAN, 1940-43

In support of Allied ground operations in North Africa and the Mediterranean, the RAAF fielded several fighter and bomber squadrons and an air ambulance unit. Although initially flying outdated aircraft, they successfully engaged the Italian forces during 1940. The entry of Rommel's Afrika Korps and the Luftwaffe into the theatre stopped Italy's retreat in March 1941.

Once equipped with more modern aircraft, Nos 3, 450 and 451 Fighter Squadrons supported the British Eighth Army as part of the Desert Air Force. No.454 Squadron, meanwhile, searched out Axis supply vessels and U-boat submarines to isolate the Afrika Korps from their supply lines across the

Mediterranean Sea. The dominance of Allied air power was a major factor in crushing the Axis armies in North Africa.

When operations in North Africa were largely completed, selected RAAF units were deployed in support of the Allied invasion of Sicily and then Italy. No.3 Squadron became the first Allied squadron to operate in Italy. Moving constantly to stay in contact with advancing ground forces, the RAAF fighter squadrons became highly mobile expeditionary units. In September 1943.

BATTLE OF THE ATLANTIC

Throughout most of the war, RAF Coastal Command fought to secure Britain's sea lanes, principally west to America and north to Russia. The critical threat to convoys of Allied supply ships on those routes was from enemy aircraft and the elusive U-boats, although surface raiders and warships also exacted a toll. No.10 and No.461 Squadrons RAAF flew Sunderland flying boats on arduous and usually monotonous searches, while No.455 Squadron RAAF flew Beaufighter attack aircraft.



ABOVE Loading a patient into a No.1 Air Ambulance Unit DH.86, Sicily.

TOP No.10 SQN Sunderland, Wales, 1941.



LEFT Trainees and instructor at No.10 Elementary Flying Training School, Temora, NSW, 1942.



German fighter aircraft and anti-aircraft fire from the vessels took a heavy toll. Nevertheless, RAAF crews claimed 18 of the 190 U-boats sunk by Coastal Command. Prior to September 1941, German raiders were able to attack shipping in the mid-Atlantic and off the Azores almost with impunity. Long-range Liberators, in which more than 300 Australians served, closed those gaps.

STRIKES AGAINST OCCUPIED EUROPE, 1941-44

By 1941, the Allies were on the offensive. RAAF squadrons joined the RAF's offensive sweeps across the English Channel to weaken the Luftwaffe and its air defence system, attacking airfields in France and hunting aircraft in the air. Although a proportion of the Luftwaffe had by then moved to the Eastern Front for the war against Russia, Western Europe remained a hazardous theatre. Flying low over heavily defended airfields was dangerous work, and novice and veteran pilots alike lost their lives.

At the same time, Allied air forces flying torpedo bombers and attack aircraft armed with rockets made daring low-level attacks against German shipping in the North Sea, severely restricting enemy resupply.

Ultimately, air supremacy allowed the pivotal D-Day landings on the French coast to be mounted in June 1944. No.453 Squadron RAAF, operating Spitfires was one of the fighter squadrons covering the landings and subsequently able to use temporary airfields established in France.

STRATEGIC BOMBING OFFENSIVE

The greatest contribution made to the Allied war effort by Australian airmen was in RAF Bomber Command, commanded by Air Chief Marshal Sir Arthur Harris. It was in that command that the RAAF suffered its heaviest losses. Pursuing Trenchard's doctrine of strategic bombing, the RAF had developed effective medium bombers in the lead-up to the war and continued their production during the war. Heavy bombers were developed from 1940 onward to target Germany, Italy and the occupied countries.

Prior to D-Day, bombing was the only means by which the western Allies could strike the German homeland and their



A No.455 SQN Beaufighter firing rockets at shipping after D-Day.

'ARTICLE XV' RAAF SQUADRONS

No.	OPERATIONAL AREAS	PRIMARY AIRCRAFT
450	North Africa, Middle East, Italy	Hurricane, Kittyhawk
451	North Africa, France, Italy, UK	Hurricane, Spitfire
452	UK, France	Spitfire
453	UK, France	Spitfire
454	North Africa, Italy	Blenheim, Baltimore
455	UK, Russia, Atlantic	Hampden, Beaufighter
456	UK	Beaufighter, Mosquito (nightfighters)
457	UK, France	Spitfire
458	UK, North Africa, Italy	Wellington
459	Sinai / Palestine	Hudson, Ventura, Baltimore, Blenheim
460	UK, Europe	Wellington, Lancaster
461	UK, Atlantic	Sunderland
462	North Africa, UK, Europe	Halifax
463	UK, Europe	Lancaster
464	UK, France, Belgium	Hudson, Ventura, Mosquito
466	UK, Europe	Wellington, Halifax
467	UK Europe	Lancaster

attacks were concentrated on Berlin and cities in Germany's industrial Ruhr Valley. By 1944, night bombing raids were having an effect in suppressing Germany's war effort, as well as channelling valuable resources in defence of its cities. The attacking bombers faced multiple threats, not only from Germany's highly sophisticated night fighter and anti-aircraft defence systems, but from the dangers of flying at night. Mid-air collisions, technical problems and crew fatigue all contributed to the high losses suffered by Bomber Command. On one occasion, 95 of 608 aircraft were lost. Approximately 10,000 Australian personnel joined Bomber Command, of whom 3,486 died in service. Whether the results of the bombing campaign justified the appalling loss of life on both sides has been debated ever since.

Several RAAF squadrons, as well as members of the RAAF spread through numerous RAF squadrons, flew in all phases of the offensive campaign including in the Battles of the Ruhr and Berlin, and the famed Dambuster raid of May 1943. An Australian, Air Vice-Marshal Don Bennett, developed and led the Pathfinder Force that performed the vital task of marking targets for attacking bombers, improving bombing accuracy from 20 to 90 percent.

AIR WAR AGAINST JAPAN

IN DECEMBER 1941, Japan launched an offensive campaign in South-East Asia and the Pacific, sending an invasion force ashore in southern Thailand and at Kota Bharu, Malaya.

At the same time another fleet

attacked the US naval base at Pearl Harbor, Hawaii. At the time, the RAAF had two bomber and two fighter squadrons stationed on the Malayan peninsula.

When the attacks came, the RAAF, focused on supporting the war in Europe, was not well prepared. Compounding the operational surprise was an underestimation of Japan's military capabilities. The Zero fighter, in particular, came as a tactical shock.

AIR ATTACKS ON AUSTRALIA

The overwhelming success of the Japanese advances of early 1942 made Australia refocus its defence strategy.



BELOW Spitfires of No.452 SQN flew offensive sweeps across the English Channel, producing numerous air aces.

On 19 February 1942 Darwin was attacked and the RAAF station damaged. A US Army Air Force (USAAF) squadron of P-40 Warhawk fighters in transit put up a courageous defence, but almost all were shot down.

Further Japanese attacks on northern Australian towns and bases created widespread fear of an invasion. In response, US P-40s moved to Darwin. On 3 March 1942, at Broome on Australia's north-west coast, more than 20 aircraft were destroyed in a raid. By May 1942, the RAAF had received 100 P-40 fighters and Australia also secured a promise from Britain to transfer three Spitfire squadrons, two RAAF and one RAF, for Darwin's defence. However, by the time they joined combat in the Darwin area in March 1943 the raids on the area, which totalled 64, had declined.



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Understanding the crucial role radar played in the Battle of Britain, the RAAF established hundreds of radar stations around Australia and on the islands to its north. The first station was under construction in Darwin at the time of the initial Japanese attacks. Ultimately, radar, combined with Coastwatchers and Volunteer Air Observer Corps created a vast early warning network.

THE PACIFIC CAMPAIGN, 1942

In March 1942, US General Douglas MacArthur arrived in Australia as Supreme Commander South-West Pacific Area (SWPA), including Australia and the region in which the RAAF would primarily operate. Australia's military effort against Japan came under his control. MacArthur did not want US servicemen serving under Australian command and, in July 1942, he replaced his air commander with Major General George Kenney in order to ensure US control. Allied air forces in the theatre soon comprised an independent US Fifth Air Force and a separate RAAF Command headed by Air Vice-Marshal William Bostock.

Air Vice-Marshal George Jones was appointed Chief of Air Staff in May 1942. Following the establishment of RAAF Command, Jones was unwilling to allow Bostock anything other than operational control of RAAF units and insisted on keeping administrative control. Bostock, supported by Kenney and MacArthur, reacted strongly, creating a feud which severely disrupted the smooth operation of the RAAF for the rest of the war.

A WOMENS' AIR FORCE

Established in March 1941, the Women's Auxiliary Australian Air Force (WAAAF) was the first of the women's Services formed during the war and enabled women to enlist for the first time. It was championed by Air Chief Marshal Charles Burnett, who saw its value in releasing men to serve overseas. While women were not permitted to serve outside Australia, by the war's end they had been admitted to more than 70 RAAF trades in the fields of aircraft ground handling and servicing, administration, radar and signals, stores and maintenance, and kitchen and mess work.

The WAAAF became the largest of the women's Services in Australia,



LEFT A Lancaster bomber is silhouetted (at lower left) over the burning Ruhr city of Hanover during a raid, 1943.



ABOVE AVM William Bostock CB DSO OBE. Artwork: Ivor Hele.



MIDDLE A Japanese Zero fighter aboard *Akagi*, one of the aircraft carriers that launched the attack on Darwin.



LEFT Radar stations of Australia's early warning network.



WWII AUSTRALIAN AIRCRAFT PRODUCTION

TYPE	ROLE	NO. BUILT
CAC Wirraway	trainer / general purpose	755
CAC Wackett	trainer	202
CAC Boomerang	fighter, army cooperation	250
CAC Woomera	strike, reconnaissance	2
CAC Mustang	fighter	200
DHA Tiger Moth	trainer	1,085
DHA Dragon	trainer, comms, ambulance	87
DHA G2 Glider	trainer	8
DHA Mosquito	fighter-bomber, photo recon	338
DAP Beaufighter	strike fighter	364
DAP Beaufort	medium / torpedo bomber	701

numbering 18,664 personnel at its peak, 12 percent of the RAAF's strength. However, it was not legally constituted as part of the RAAF until 1943.

ALLIED SUCCESSES, 1942

In 1942, the Allies achieved their first successes in the Pacific. No.75 Squadron P-40 Kittyhawks defended Port Moresby from six weeks of Japanese air attacks. In May, a Japanese invasion force bound for Port Moresby was forced to turn back



ABOVE WAAAF riggers, mechanics and armourers worked on aircraft along with RAAF maintenance staff. The Spitfire is at Laverton, Victoria in 1942.



LEFT WAAAF recruiting poster.

because of its defeat at the Battle of the Coral Sea, the first ever action fought between aircraft carriers.

From July, RAAF and US air support were indispensable to the Allied success in the campaign along the Kokoda Trail, which linked New Guinea's north-east coast with Port Moresby. Allied air forces protected the ground forces and airdropped vital supplies throughout the campaign.

RAAF air power was acclaimed as 'the decisive factor' in the battle of Milne Bay, at the south-eastern tip of New Guinea in August and September, which achieved the first defeat of the Japanese on land. Kittyhawks from Nos 75 and 76 Squadrons, together with Hudson bombers of No.32 Squadron, devastated Japanese landing barges in nonstop attacks. With the help of Coastwatchers, the fighters also effectively intercepted and negated incoming Japanese aircraft.

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COUNTEROFFENSIVE, 1943

Following their early defeats in the Pacific theatre, the USAAF and RAAF Units in Australia were reinforced with American heavy and medium bombers. Operating from newly constructed airfields in Australia's north, those aircraft flew massed raids against enemy airfields and communication positions in New Guinea and New Britain. The offensive air war over land in the SWPA became primarily one of bombing tactical ground targets and played a key role in containing the Japanese advance.

RAAF IN BURMA, 1943-45

The Japanese invaded Burma with the aims of cutting Chinese and British supply lines, securing resources such as oil and rice, establishing a buffer for recently occupied Siam (Thailand), and opening the way for a possible invasion of India. Japan's invasion of Burma took the Allies by surprise. Initially, Rangoon was defended by a single RAF fighter unit and a squadron of the American Volunteer Group, the famed Flying Tigers. That force was soon considerably expanded, although Burma was always seen as subordinate in importance to the European and Pacific theatres.

Although no RAAF squadrons operated in the Burma-India theatre, many RAAF personnel served among the RAF squadrons. India-based Beaufighters made long-range, low-level attacks on Japanese lines of communication, aerodromes and troop concentrations. Liberator heavy bombers conducted tactical bombing, sea patrols and special operations to air-drop agents and supplies. By November 1943, more than 500 Australian aircrew were serving with 58 RAF squadrons in India, some as squadron commanders.

BATTLE OF THE BISMARCK SEA, 1943

After signals intelligence indicated impending Japanese reinforcements for the northern coast of New Guinea, a US bomber crew sighted an enemy convoy outward bound from Rabaul on 1 March 1943. RAAF Bostons made a dawn raid on Lae air base, a prelude to sustained attacks on the ships. RAAF Beaufighters attacked at mast height to silence the anti-aircraft guns, followed by USAAF Mitchells making 'skip bombing' attacks.

Over two days, all eight Japanese transports and four of the destroyers were sunk for the loss of only four US aircraft. Subsequently, barges and rafts crowded with Japanese survivors were destroyed. General MacArthur described the Battle of the Bismarck Sea as 'the decisive aerial engagement' of the war in the SWPA.



ABOVE LEFT RAF Liberator bombers with part-RAAF crews taxi out at a Bengal base for an attack on Mandalay in Burma, January 1945.

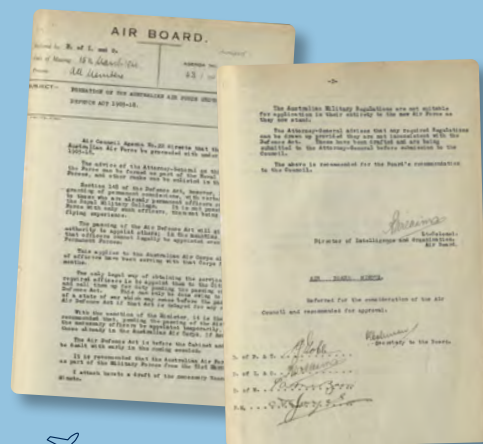


ABOVE Douglas Boston, Consolidated Catalina, Bristol Beaufort.

AUSTRALIAN AIR FORCE ORIGATION

The establishment of a legal, independent Air Force originated with an Air Board decision dated 15 March 1921 that recommended "the Australian Air Force be formed as part of the Military Forces from the 31st March, 1921".

In his 1991 book, *The Third Brother*, author Chris Coulthard-Clark quoted Sir Richard Williams' decision on that date "rather than the commencement of the following month to prevent nasty people referring to us as April Fools" – notwithstanding that three years earlier, the RAF had chosen 1 April as its own formation date.



Air Board Agenda 43 (RAAF). Images: National Archives of Australia, courtesy History and Heritage Branch RAAF.

FIRST TACTICAL AIR FORCE

The First Tactical Air Force (TAF) was formed in October 1944 from No.10 Group, RAAF. Since 1942, many, from the Prime Minister down, had been concerned that the RAAF would be denied an equal share in offensive operations and the Australian Government hoped its forces would contribute to the Philippines invasion force. However, when American forces landed at Leyte in October, MacArthur ensured there was minimal Australian involvement.

Air Vice-Marshal Bostock secured agreement for the First TAF to be used in Borneo and the Celebes area. While US forces occupied Okinawa, Australia concentrated on 'mopping-up' operations and pre-invasion strikes in the Borneo region. Some in the RAAF became disgruntled with the apparent misuse of the force, particularly as lives were being lost. By April 1945, discontent brought about the 'Morotai Mutiny' when eight fighter leaders resigned their commissions; they were later reinstated after an enquiry. Such events demonstrated the problems of working under MacArthur's command and the inherent weakness in the higher command of the RAAF.

After the Oboe amphibious invasions of Borneo at Tarakan, Balikpapan and Labuan during May-July 1945, RAAF Airfield Construction Squadrons moved

in to prepare airfields for RAAF fighter and bomber squadrons.

MARITIME BLOCKADE

The RAAF carried out a wide range of offensive operations throughout the war. Catalina flying boats ranged over vast areas, bombing and mining enemy harbours from Sumatra to Hong Kong. During the last year of the war, RAAF long-range Liberator heavy bombers, operating first from bases in north-western Australia and then from Morotai and Borneo, conducted wide-ranging maritime bombing attacks. That effective blockade of Japanese maritime transport routes was one of the RAAF's most

important contributions in the Pacific theatre. By 1945, the blockade, combined with submarine attacks, prevented the Japanese resupply of many of its deployed units. Despite the Minister for Air urging that at least two squadrons of Liberators should participate in the bombing of Japan, that action did not materialise.

On 6 and 9 August 1945, USAAF atomic bomb attacks destroyed the Japanese cities of Hiroshima and Nagasaki. The majority of the RAAF's operation force was still in Borneo, the Celebes and Australia when, on 15 August, Japan surrendered. **W**

To be continued next edition

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COMBAT EXPERIENCE

IN 1968, RAAF SQUADRON LEADER **ALAN REED** WAS TEMPORARILY ASSIGNED TO 12TH TACTICAL RECONNAISSANCE SQUADRON (USAF) IN TAN SON NHUT, VIETNAM. HE LATER RECORDED HIS MEMORIES OF THAT TIME.

WAS POSTED ON exchange to the 363rd Tactical Reconnaissance Wing at Shaw Air Force Base, South Carolina to fly RF-4C Phantoms with effect August 1967. The appointment was to be as an instructor pilot in the 4415th Combat Crew Training Squadron.

After undergoing training for a short while, I recognised that if I were to do my job effectively as a combat crew instructor, I really needed to get some combat experience. My previous background had been on obsolete Lincoln and Canberra bombers and I had little experience in fighter-type aircraft. I also saw the need to establish credibility if I were to teach students to go and fight a war. And so I began a process to obtain approval to fly with the US Air Force (USAF) in Vietnam. That was ultimately accepted, and I was attached to the 460th Tactical Reconnaissance Wing at Tan Son Nhut on temporary duty for 179 days, with effect late May 1968.

The Americans were keen that I be properly prepared for the combat mission. Consequently, I undertook a number of survival courses, including code-of-conduct training that involved an evasion phase followed by an



interrogation phase and, ultimately, time spent in a simulated prison compound. Parts of that training were quite daunting as I had never been locked in a small, darkened room for 24 hours without space to lie down, nor had I been confined in a box about 36 inches square for up to an hour at a time.

On my way to Vietnam, I underwent a jungle survival training course in the Philippines. Having completed the RAF course at Changi, Singapore some years previously, I found the Philippines course somewhat redundant. However, the evasion phase of the course was useful in that we learnt how difficult it was to hide from the skilled native hunters and trackers from that area and about the nasty but simple devices used by the North Vietnamese to injure or disable an evader.

By the time I arrived in Vietnam, I had flown about 120 hours on the RF-4C and completed basic and operational conversion, plus some squadron instructor training, so I was reasonably up to speed with the aircraft and its application.

Operational direction by Command in Australia and the USAF was that I was not to fly into Cambodia. On arrival in Vietnam, I was briefed by the 460th Wing Deputy Commander and we both took the direction to mean that North Vietnam and Laos were acceptable. However, on repatriation, I learned that I should not have been operating into the North either. In all respects, I was treated as just another USAF combat reconnaissance pilot.

My flying in Vietnam was with the 12th Tactical Reconnaissance Squadron (TRS), one of two RF-4C squadrons operating out of Tan Son Nhut. The two RF-4C squadrons (12th and 16th) comprised part of the 460th Tactical Reconnaissance Wing, which also included a RF-101 Voodoo Squadron (45th TRS) flying day missions only.

On arrival at the squadron, I went through the routine check-in procedure, mission and local area briefs prior to my first flight check with the squadron instructor pilot. I was then assigned an experienced navigator who saw me through my first 10 missions and gave me the experience to operate with



some confidence in Vietnam. The navigator had been shot down about two months earlier and his pilot was listed "missing". Surprisingly, the navigator had landed on one side of a hill and had been picked up in very short order, while the pilot had landed on the other side and been captured, so that really was the luck of the game. I bumped into the navigator in Washington years later and he told me his pilot had been taken prisoner and had been recovered from North Vietnam in fairly good condition.

After 10 missions with the experienced navigator, I teamed up with the navigator from Shaw with whom I had trained, Jim Melton. Our good-hearted Squadron Commander assigned us an almost new (1967 vintage) RF-4C, which we nicknamed the Carolina Kangaroo. Jim came from North Carolina so for RF-4C 67-448, the name was a natural.

The two RF-4C squadrons were assigned 12-hour duty periods per day: 0600 to 1800 for daylight operations and 1800 to 0600 for night missions. Squadrons rotated between day and night missions monthly. Each squadron was equipped with about 22 aircraft and we normally flew 20 sorties during each 12-hour period.



TOP RAAF SQNLDR AI Reed (front right) at Shaw Air Force Base, South Carolina in 1967 during a F-4 Instructor Conversion Course.

ABOVE Major Jim Melton USAF Navigator (left) and SQNLDR AI Reed with the Carolina Kangaroo.



FAR LEFT SQNLDR AI gets the traditional hose down after completing 100 missions.



ABOVE SQNLDR Al Reed in the Carolina Kangaroo cockpit.



BELOW Suit badges.



The RF-4C was unarmed and our motto, Alone, Unarmed and Unafraid, held a certain irony. Day missions were primarily photographic using a split vertical or high panoramic camera depending on the likely target and assessed enemy defences with a low panoramic camera carried as a backup.

Most missions were flown in South Vietnam up to the De-Militarized Zone (DMZ). Two sorties each day were flown into North Vietnam or Laos when on day operations. Those were termed out-country missions.

Crews would be programmed the day before and three hours prior to planned take off, the crew would appear at the squadron for target allocation, and intelligence and weather briefs. Briefings were not terribly detailed but covered aspects such as known friendly forces in the area, artillery support, any known disposition of enemy forces and frequencies to call for clearance to enter an area so that we would not be shot down by friendly artillery fire. Crews were

left largely to their own devices to plan a mission and the techniques to be used would depend on any expected enemy defences and the type of terrain through which we were flying, particularly if it was to be a low-level mission.

Daytime targets were typically general in nature and included opportunities such as road reconnaissance, looking for vehicle congregations or small bridges and river crossings, and for night missions, areas of likely concentration of North Vietnamese Army (NVA) troops. NVA tanks were occasionally located in South Vietnam near Khe Sanh during some offensive actions into the South.

Out-country missions were inevitably refuelled prior to entering North Vietnam or Laos. An aircraft with the call-sign CROWN, a command-and-control C-130 permanently stationed off the coast of North Vietnam, was the controlling authority. We were required to contact CROWN prior to entering North Vietnam and again on departure. In that way, the USAF managed to maintain close control of aircraft operations into the North and any aircraft lost could be readily located from their advised flight plan. Most of the out-country missions flown from Tan San Nhut were into the lower "route packages" of North Vietnam. I flew most of mine into Route Package One, a designated area just north of the DMZ. I remember on one occasion, however, flying a road reconnaissance into Route Package Two in an area where there was believed to be a surface-to-air missile (SAM) site near Vinh. On another occasion I located an F-4 crash site. Those missions contributed to the US Forces DFC I was awarded.

Most missions were into reasonably well defended target areas and the technique was to fly very fast at an altitude between about 4,500 feet, which was just outside light ground fire, and 7,500 feet, the altitude above which the SAM 2 missile became effective. We had all our sensors running and would fly at about 600 knots. At that speed, the Phantom used fuel at an alarming rate and we would inevitably have to refuel on exit from North Vietnam. There were two KC-135 tankers in orbit south of the DMZ and over the sea, and it was

routine to arrange a rendezvous with them before returning to base.

Night missions employed an infrared (IR) line scan sensor to locate hot spots such as camp fires and vehicles with hot engines, and were flown at a maximum of 2,000ft above ground. An area, typically 10 miles long and six miles wide, would be scanned in a series of parallel tracks to produce seven or eight lines of overlapping IR imagery. We would normally be assigned three target areas to cover each mission. The RF-4C had a primitive terrain-following radar and terrain following was flown manually using track guidance from the inertial navigation set. Turns at the end of each leg were made at 55 or 65 degrees of bank to achieve the required lateral spacing for complete sensor coverage. By the end of a month flying at night to that precision, we were fairly proficient at instrument flying.

On completion, the aircraft would be met by a photographic section crew, the films unloaded and immediately dispatched to the WS430 Processing and Interpretation Center. There was so much film generated from the 460th Wing (half a million plus feet a month) that it was impossible to properly interpret all of it. Thus, if a crew felt they had good results, that film would be prioritised. Crews were usually required to review their

film with the photographic interpreter. I personally recall seeing very little evidence of enemy concentrations on the IR line scan film I brought back. I do remember finding a few camp fires which were later identified as Vietcong concentrations. On one night trip, I visually identified a convoy of vehicles which were obviously NVA and flew over the road with the IR line scan operating. I reported the vehicle activity by radio but left the area before any artillery or aircraft action.

On one occasion, while happily flying an IR line scan mission, the hillside right next to the aircraft erupted in an artillery barrage of possibly friendly fire. One of the problems in Vietnam was the command-and-control aspects of controlling our artillery fire while aircraft were operating in an area, and I believe aircraft were occasionally shot down by friendly artillery. Having seen the hill next to me erupt, I can easily understand that happening.

I do not recall any particularly hazardous sorties. The areas in which our squadron operated into the southern route packages were fairly quiet. On one occasion, I did capture photographic evidence of a SAM site in North Vietnam. I saw evidence of ground fire on a few occasions. During the day it was very difficult to identify, but at

night there was usually plenty of tracer activity from the ground.

On one occasion, I thought I had taken a hit from ground fire because of a failure in the oil system of one engine. I shut the engine down and landed at Phu Cat, an abort base on the east coast. In accordance with procedures when suspecting battle damage, I did an approach end cable engagement and that qualified me for membership of the Grand Order of the Tape Dragons club.

While I was in Vietnam, five or six aircraft from the Wing including two from my squadron were lost. One of the crew killed was the Vice Commander of the 7th Air Force, Major General Bob Worley. General Worley was flying with Major Bob Brodman (our squadron instructor pilot) in the back seat. A hit in the nose of the aircraft caused a fire to begin in the film, of which that area was full. They cleared the danger area and went feet wet in preparation for ejection. An F-100 "Misty" Forward Air Control (FAC) aircraft accompanied them. In accordance with established procedures, the back-seater initiated his ejection first.

Unfortunately, as soon as Major Brodman left the aircraft, the front seat was engulfed in flames because of the massive draft caused by the rear canopy separation. General Worley was not able




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to eject, and the aircraft crashed on the beach. That was the end of generals flying combat missions in Vietnam.

The other crews from the Wing were recovered a short time after ejecting in South Vietnam. We had a great deal of confidence in the rescue services and had enormous respect for all those crews who would do anything to extract a downed aircrew. Incidentally, the pilot of the Misty FAC was Dick Rutan who later flew Voyager around the world, un-refuelled and non-stop. He tells his Misty story online (see tom.pilsch.com/Images/Loss%20of%20Strobe%2001-article.pdf).

More than 10,000 aircraft (helicopters included) were lost in Vietnam including more than 750 Phantom-type aircraft. Of those, 83 were RF-4Cs.

Squadron personnel were initially quartered in an old hotel in downtown Saigon. During the Tet offensive, the hotel came under attack and two aircrew members were killed. Subsequently, the squadron moved on base to a more secure area. The

quarters on base were quite primitive huts with two small bunks to each room.

On a humorous note, the standard procedure for new arrivals was to be allocated the top bunk so that they could catch any shrapnel which came in during the frequent rocket attacks experienced at the time. I remember the first night, having had a few beers in the club, going to bed in the top bunk and being awakened by an enormous explosion, which seemed to be just outside the room. I fell out of bed and found my roommate already sheltering under the bottom bunk. A C-130 had been blown up on the ramp about 400 yards away.

At that stage, I asked myself why the hell I had been so keen to get into this little action. The only squadron casualty that night was one of the navigators with whom I had travelled to Vietnam. He tumbled out of the top bunk and sprained his wrist when he hit the floor.

Most crew owned push-bikes and we would ride from the quarters to the

squadron, to the club for meals, to the swimming pool and to the Vietnamese Officers Club which possessed a few "other attractions". On three or four occasions, a few of us not programmed for flying managed to obtain one of the squadron vehicles and head into downtown Saigon to the International Club for a steak, a few drinks, and to sample the local night spots. One of my friends was a little nervous of this venture and we would always arm ourselves to the teeth with rifles. We also had a handgun which he placed on the seat next to him in the event of real trouble. In fact, it never happened.

During my 179 days of temporary duty in Vietnam, I flew 100 combat missions, so most days evolved around squadron flying or undergoing ground training. Ten of my missions were out-country. I was pleased to have had the experience because I was finally doing what I had been trained to do. There was a job to be done and I was pleased to have been part of it. 

Squadron Leader A. R. Reed, 1985

McNAMARA VC: A HEROIC RESCUE



FOR THE SECOND IN OUR SERIES ON THE AUSTRALIAN AIRMEN AWARDED THE VICTORIA CROSS, WE GO BACK TO 1917, PRIOR TO THE FORMATION OF THE RAAF.

THE SOLE VICTORIA CROSS awarded to an Australian airman in World War I went to an Australian Flying Corps (AFC) officer in Palestine, Lieutenant Frank McNamara. His entry in the *Australian Dictionary of Biography* describes the action:

In March 1917, the allies were planning an attack on Gaza. An important Turkish supply centre, known as Junction Station, was subjected to repeated air attacks by No.1 Squadron AFC and No.14 Squadron Royal Flying Corps. On 20 March, an Australian aircraft from No.1 Squadron, piloted by Captain D. Rutherford, was forced to land after being hit by ground fire. Although his BE2C aircraft was a two-seater, he was flying solo at the time. A large body of enemy cavalry had seen the aircraft land and galloped towards it.

McNamara, who had been on the same raid and had been wounded after encountering heavy anti-aircraft fire, was flying his Martinsyde home. He saw what was happening and despite a severe leg wound decided to attempt

a rescue. He was able to make a safe landing beside Rutherford who at once climbed aboard McNamara's aircraft. However, the Martinsyde was a single-seater and Rutherford could only stand on the wing and hold on to the struts. His weight made the aircraft very lop-sided and his presence in the airstream added extra drag to one side. Owing to his wound, and these extra problems, McNamara was unable to control his machine on the rough ground and crashed it badly on attempting to take off.

The two airmen set fire to McNamara's aircraft and returned to Rutherford's machine, which by this time was close to capture by the Turkish cavalry. Also, by then, the enemy had begun firing at the escaping airmen. With bullets kicking up the sand nearby, McNamara managed to climb into the pilot's seat while Rutherford went to work on the engine. While McNamara provided what covering fire he could with his revolver and with the enemy almost upon them, Rutherford swung the heavy four-bladed propeller.



TOP The incident for which Lieutenant F.H. McNamara was awarded the VC by Septimus Power (oil on canvas, 1924).

ABOVE Frank McNamara VC. Images: AWM.

Fortunately, the engine fired at the first attempt and Rutherford jumped into the observer's seat as McNamara gave the aircraft full throttle.

Despite some damage to the struts and fuselage, and with McNamara fighting pain and close to unconsciousness from loss of blood, he managed to get them off the ground safely. He then flew them 113km back to their home base at El Arish. Making a safe landing, he was given medical assistance but lost consciousness from loss of blood and an allergic reaction to an injection.

For this brilliant rescue, carried out under extremely hazardous conditions and under heavy enemy fire, McNamara received the only VC awarded to an Australian airman in World War I.

*Frances Hubert McNamara VC, CBE, CB (1894-1961) served in the RAAF from 1921 to 1946 and retired with the honorary rank of air vice marshal. **W***

Extract from A.D. Garrisson 1986, "McNamara, Frank Hubert (Francis) (1894-1961)", Australian Dictionary of Biography via <https://adb.anu.au>

AUSSIE PILOT NUMBER ONE

BILL HART, THE 'FLYING DENTIST', WAS AUSTRALIA'S FIRST AVIATOR AND A RESOURCEFUL, COURAGEOUS PIONEER.

DENTIST BILL HART (1885-1943) was Australia's first qualified pilot and the first Australian to fly further than a 'short hop'. In September 1911, less than two years after the first powered flight in Australia (by an Englishman), Hart bought a Bristol Boxkite from New Zealander J.J. Hammond and learnt to fly it. Although the aircraft was soon wrecked, Hart rebuilt it from the remains. His Australian aviation firsts quickly mounted:

- First cross-country flight (29km from Penrith to Paramatta), 4 November 1911
- First aviator's license awarded to him by the Aerial League of Australia, 5 December
- First aviation school, January 1912 (moved to Ham Common, now RAAF Base Richmond, in March 1912)
- First flights carrying a cinematographer, resulting in three movies of the NSW countryside from the air
- First air race, won on 29 June 1912.

Hart had been challenged to the race by America's 'daredevil bird man', A.B. 'Wizard' Stone. Originally the route was to be from Sydney to Melbourne, but at the time many thought such a distance in variable weather conditions would be impossible. (A flight from Melbourne to Sydney was accomplished two years later by the French aviator



Maurice Guillaux in his Bleriot XI monoplane which now hangs in Sydney's Powerhouse Museum).

Stone's second preferred route was from Bathurst to Orange and back, but the contestants finally settled on Hart's preferred shorter route of 26km from Sydney's Botany Bay to Parramatta. The honours went to Hart, as Stone lost his way in a rain squall.

Hart also built himself a two-seat monoplane, which was wrecked in a serious accident at Richmond in September 1912. Badly injured, he never flew again. In 1916, he served with the Australian Flying Corps' No.1 Squadron in Egypt and England as a ground instructor.

At the time of his death in Sydney in 1943, Hart was vice-president of the Air Force Association and was given a RAAF flypast in salute. In 1963, a memorial to Hart was unveiled at Parramatta Park. **W**



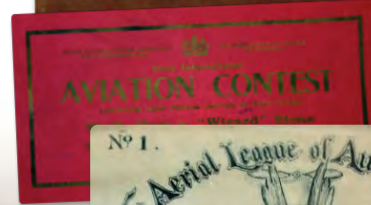
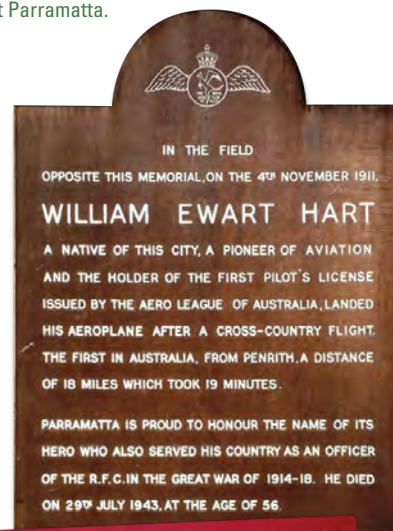
LEFT Hart with the Smith brothers.



BELOW LEFT Hart at his Boxkite.



BELOW Hart memorial at Parramatta.



• Russell Garth sent the images displayed to RAAF Association Publications Managing Director Neil Smith. The memorabilia was discovered in an old suitcase by an acquaintance of Russell's brother.





A LONG WAY FROM MULLEWA

AGED 18, GEORGE OLSEN ENLISTED IN THE RAAF IN 1942 AND TWO YEARS LATER JOINED NO.460 SQUADRON RAAF. HE WAS KILLED OVER GERMANY ON HIS FIRST OPERATION.



IN NOVEMBER 1944, FLTSGT George Olsen sent a Christmas aerogram from RAF Hemswell, Lincolnshire, UK, to his brother Les who was with the AIF in

Australia. *Hoping that you will get this before Xmas*, he wrote. Shortly after Les received the aerogram, the family received a telegram: George was missing over Germany.

George Glenn Olsen was born on 17 February 1924 in Mullewa, a small wheat-belt town near Geraldton, Western Australia. He was the son of Alicia Margretta Olsen and William Charles Olsen, the town blacksmith. Known as Jack to family and friends and on the football field, he attended Mullewa State School and then Perth Boys School, followed by Perth Technical College in 1940.

After leaving school he was employed as a junior worker at WA Government Railways, but George was determined to get into action. Aged 18, he enlisted in the RAAF on 9 December 1942, and trained in Victoria as a wireless operator/air gunner.

In September 1943, George took leave to see his family before embarking from Sydney for the UK.

He completed his wireless training with the RAF and after D-Day, 6 June 1944, crewed up with his skipper FLG OFF Peter Walter RAAF for operational training on Wellington and then Lancaster bombers. After the conversion course he sent Les a cheerful aerogram: *12 days leave – had an extra good time – all but one day in Brighton, and one day in London.*

George's crew had one more training posting, to Lancaster Finishing School at Hemswell, before they joined the famed No.460 Squadron RAAF at nearby Binbrook on 22 November 1944.

Their first operation was set for 6 December. At 1645 hours they took off in Lancaster ND971 (squadron code AR-K2), joining a 'maximum-effort' night operation for the squadron's 24 Lancasters. It was RAF Bomber Command's first major attack on an oil target in eastern Germany: a synthetic oil plant at Leuna. Lancaster ND971 carried a mixed bomb load: a 4,000lb 'cookie', a 1,000-pounder, eight 500-pounders and incendiary clusters.

The sky over Germany was overcast, with cloud tops up to 14,000 feet. Visibility fell to nil. With 487 bombers filling the sky on a 1,600km round trip, the risk of mid-air collision was high. Some time after 2100 hours George's aircraft collided with Lancaster ND703 of 635 (Canadian) Squadron and crashed near the village of Weddingen.



LEFT A Lancaster taxiing at night.



BELOW LEFT George Olsen.

In the explosion, pilot Peter Walter was thrown clear and parachuted safely down. He was captured and taken to the prisoner of war camp Stalag Luft I at Barth. George and the other five crewmen were killed. Their bodies were found near the aircraft, two with their right hands on the parachute release handle.

The Canadian Lancaster, ND703, flew on for a few minutes and crashed near Vienenburg, 5km south-east. Five of its crew were killed, and two air gunners were taken prisoner.

The rest of 460 Squadron continued on. Flak over the target was light and there were few enemy fighters. Despite the cloud, considerable damage was done to the oil plant. George's Lancaster was the only one lost from the squadron that night.

The next day a Luftwaffe detachment salvaged the wreckage of ND971 and transported it to the airfield at nearby Goslar. George and his crew were buried in Weddingen Cemetery, where the Bürgermeister of Weddingen and some villagers erected six plain crosses.

In 1947, the airmen were reburied in Brunswick and then in Hanover War Cemetery. Only Sergeants Jury and Sadler could be identified. The other four crew (FLTSGT Olsen, FLG OFF Andrews, SGT Moule and SGT Charlesworth) were buried in a communal grave with individual headstones.

Twenty-year old George Olsen is commemorated on the Australian War Memorial Roll of Honour, the State Memorial in Perth and the Mullewa Roll of Honour. He is a long way from Mullewa, but as it says on his headstone, he is 'ever remembered'. **W**

Charles Page, History Project manager, RAAFA WA Australian Air Force Cadets Branch, with thanks to the Olsen family.

SUPERMARINE SPITFIRE MK VIII.

WINGS VOLUME 73 NO.2





Grey Nurse



A pair of F/A-18B Hornets in operational readiness shelters for Exercise High Sierra. Photo: SGT David Gibbs.

GUARDING THE NORTH

HAVING PLAYED A CRUCIAL ROLE IN WWII, RAAF BASE TOWNSVILLE REMAINS ONE OF NORTHERN AUSTRALIA'S PRIMARY DEFENCE INSTALLATIONS.

RAAF BASE TOWNSVILLE was established in 1939, a timely decision that would ultimately contribute to the declaration of victory in the Pacific on 15 August 1945.

On 7 December 1941, Japan entered World War II, launching its Pacific campaign with simultaneous raids on United States territories at Pearl Harbor, Wake Island and Guam as well as Hong Kong, the Philippines and northern Malaya.

Malaysia, Singapore, the Dutch East Indies and the Solomon Islands all fell quickly to the Japanese onslaught. Japan then directed its powerful navy and air force towards Papua New Guinea, New Britain, Fiji, Samoa, and New Caledonia, with the aim of isolating Australia from its main ally, the United States. War was now on Australia's doorstep.

In 1942, RAAF Base Townsville came to play a critical role in the Battle of the Coral Sea. Located just a few hundred kilometres from that pivotal air and sea battle, the base quickly expanded to become, at one point, one of the largest

US Air Force (USAF) bases outside of the United States. Townsville became a key military hub in the Pacific Theatre, as the Allies steadily forced the Japanese back. The combined effects of the Battle of the Coral Sea, Midway and later the Solomons Campaign, turned the tide of the Pacific War.

RAAF Base Townsville with its motto Guarding the North, along with RAAF Base Darwin, remains strategically important to the defence of Australia.

As one of northern Australia's primary Defence installations, Townsville supports a wide variety of aircraft types, from civil and training aircraft to ADF combat assets such as the F/A-18 Super Hornet, C-17 Globemaster, C-47 Spartan and KC-30A tanker.

The 5th Army Aviation Regiment, with its squadrons of CH-47 Chinooks and MRH-90 Taipan helicopters, reinforces the versatility and capability of the base.

The RAAF base is often used as a staging or stepping-off point for forces deployed on military operations and Australian humanitarian and peacekeeping efforts in South-East



Asia and the north-east and east Pacific Ocean regions. Operations Bushfire Assist, Covid-19 Assist, NSW Flood Assist and Fiji Assist are recent examples. The base may also be used as a mounting base or forward operating base for Air Force and Naval Support operations in the Coral Sea.

Situated close to a major Air Weapons Range at Townsville Field Training Area and to the Lavarack Army Barracks, home of the Army's 3 Brigade, it also provides important infrastructure to support aircrew and soldier operational training functions.

A range of operational training exercises involving Air Combat Group, Air Mobility Group and elements of the Australian Army and Navy are hosted at the base each year. Exercise Talisman Sabre is a major multi-nation activity staged every two years. RAAF Base Townsville will once again be a hive of aircraft action when the 2021 exercise program commences in mid-July.

RAAF Base Townsville is home to a large number of units including:

- No.383 Squadron - contingency response equipment and personnel.

- No.452 Squadron Townsville Flight - air traffic control functions.
 - No.27 (City of Townsville) Squadron - airbase operations.
 - Combat Survival Training School - evasion and escape training.
 - 1 Expeditionary Health Squadron Detachment Townsville – deployable medical support.
 - No.2 Security Squadron detachment Townsville – garrison security.
- HQ RAAF Base Townsville is also

responsible for personnel and ADF assets located at RAAF Base Scherger, one of the Royal Australian Air Force's three 'bare bases', completing a chain of bases across Australia's Top End. It was officially opened by then Prime Minister John Howard on 5 August 1998.

Scherger is located 26km east of Weipa on the western side of Cape

York. The base consists of a 3,050m runway with a parallel taxiway and one oblique taxiway which can also be used as a runway. The base has facilities to cater for 400 personnel in fixed accommodation, 1,000 personnel in tent lines and about 40 aircraft.

RAAF Base Townsville will continue to guard the north into the future as the Department of Defence has committed to major refresh works to cater for new aircraft types such as the F-35 Lightning II and contemporary mission scenarios. [W](#)



RIGHT Troops disembark a C-130J at RAAF Base Scherger. Photo: CPL David Said.

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ANZACS, SUNBEAMS & DEWDROPS

THE RAAF APPRENTICE TRAINING SCHEME BEGAN IN 1948 TO ADDRESS POST-WAR SHORTAGES OF SKILLED TRADESMEN, AND CONTINUED UNTIL 1993, PRODUCING SOME 5,000 GRADUATES.

THE SUMMER 2020 EDITION of *Wings* featured RAAF Base Wagga, NSW, formerly RAAF Station Forest Hill ('Home of the Airman') and detailed the development of the base post-war including the RAAF School of Technical Training (RSTT). However, the feature omitted to acknowledge the RAAF Apprenticeship Scheme operated by RSTT and the 5,000 skilled tradesmen it graduated over 45 years.

The RAAF Apprentice Training Scheme commenced in 1948 for 15 to 17-year-olds, to address post-war shortages of skilled tradesmen and to ensure the RAAF was able to support the anticipated growth of inventory and operations. The intent was to enlist 150 engineering apprentices, 50 radio apprentices and, under the Junior Equipment and Administration Training Scheme (JEATS), a number of non-technical trainees every year.

Engineering apprentices were trained at the then Ground Training College (later named RAAF Technical



ABOVE Engine inspection.



ABOVE RIGHT Filing.

College and finally RAAF School of Technical Training) at RAAF Base Wagga. Radio apprentices were trained initially at Melbourne Technical College, RAAF Frognall and RAAF Air and Ground Radio School at Ballarat, Victoria, and finally at the Royal Melbourne Institute of Technology and the RAAF School of Radio at RAAF Base Laverton, Victoria. The JEATS enlistees were initially trained at RAAF Base Rathmines, NSW and then, from 1953, at RSTT Wagga.

The apprentice scheme delivered many of the qualified ground staff needed during the RAAF's post-war redevelopment period and well into the subsequent maturing years. Importantly, ex-apprentices were a primary feeder for non-commissioned and commissioned cohorts in engineering and logistics, special duties and aircrew roles.

The JEATS was disbanded in 1959 and the engineering apprentices scheme changed its form over the ensuing years until it too was disbanded in 1993, under pressure of modern vocational education and training protocols.



ANNUAL INTAKES

In January 1948, the first intake of apprentices, nicknamed Anzacs, only managed a total of 53 teenagers for aircraft trades and 15 for radio training and it was necessary to recruit a mid-year intake. The numbers improved somewhat in July 1948 when the second apprentice intake (Rainbows) arrived at Wagga – all 75 of them. The third intake (Sunbeams), comprising 134 apprentices, arrived in January 1949 and the fourth (Dewdrops) arrived in January 1950.

For the next 45 years, until the graduation of intake 46 (Sprogs) in 1993, RAAF Wagga hosted several hundred apprentices at any one time.

The RAAF Apprentice Scheme was also host to international trainees and in 1951 the first of two groups of 20 trainees from Pakistan arrived at Forest Hill. From 1960 until 1981 each intake included trainees from the Royal New Zealand Air Force. Competition among international trainees resulted in a high calibre of trainee and often they came with previous Air Force service and were slightly older than the average Australian trainee. Needless to say, both Pakistani and Kiwi apprentices performed particularly well and on a number of occasions took off prized awards at graduation.

From arrival at RSTT, drill instruction was a daily activity and ensured the morning parade was done with reasonable military precision and that apprentices were suitably trained to meet the many ceremonial parades they would be called on to support. Drill instructors showed little mercy and parade standard drill in oversized

thick cotton overalls, hob-nailed boots and fur-felt hats in the summer heat tested the mettle of the young recruits. Apprentices were also expected to shave daily by 0750 hours, however many of the young lads only used the razor every second or third day and still managed to pass inspection.

The RAAF had a duty of care to look after their charges as parents would have done. That included accommodation, meals, work uniform, recreational uniform, appropriate basic and trade training, religious instruction and physical fitness. Apprentices also enjoyed a raft of sporting opportunities; two weeks' leave in the winter and four weeks' leave in the summer which included free trips to visit next of kin.

TRAINING

The first six weeks after enlistment involved kitting out, assignment to flights within the Initial Training Squadron (ITS), general service training (fire, NBC, service rules and regulations etc) and intensive drill instruction on the Bull Ring. During that period, hairstyles were short back and sides, leave was disallowed and civilian clothing was not permitted. It was the apprentices' equivalent of Rookies and for many it was a significant culture shock.

Following basic training, apprentices underwent basic engineering training that lasted for six months (12 months for intakes 1-15) and consisted of engineering and workshop practice, metalwork (cutting, filing and measuring), welding, metal turning, blacksmithing, carpentry, sheet metal work and technical drawing.

On completion of basic training, apprentices were allocated a trade. The trades offered at RSTT were instruments, electrical, armament, engines, airframe and motor transport, and most apprentices received their first choice. Once selected for a trade, they reformed into trade flights and moved accommodation to locate trade members together.

At the completion of training and after successfully passing a trade test, apprentices were awarded a RAAF Apprentice School Graduation Certificate, which certified the individual



LEFT Footy team at Wagga, 1965.

was serving an apprenticeship of five years and had completed a period of full-time training at RSTT.

Graduation involved a parade, with a six-week period of intense preparation, followed by a graduation ball with proud parents and girlfriends in attendance.

The (now) aircraftsmen were posted to RAAF aircraft depots or squadrons for continuation training and aircraftsmen-type duties relative to their trade. They started taking responsibility for engineering tasks. In about 1962, Department of Air notified RSTT that it was no longer mandatory for all apprentices to serve a year at an aircraft depot and from intake 15 onwards, apprentices were posted to "any suitable unit for productive employment".

Five years after they started at Wagga, graduates received an Apprentice Proficiency Certificate stating they had

completed the prescribed term of five years as an apprentice and had attained the trade standard as determined by the Air Board. The certificates had the imprimatur of the Australian Council of Trade Unions ensuring that the training received was recognised in civilian enterprise.

Interestingly, adult trainees (known affectionately as Thicks) also underwent trade training at Wagga along similar lines as apprentices. The difference being that adult trainees completed an initial three-month military trainee course and then trade training as mechanics for six months. They were then posted out to the RAAF squadrons for 12 months' on-the-job training before returning to Wagga to complete a fitters course of about seven months. The end result was that apprentices and adult trainees finished with the same qualification.

RETURN OF SERVICE

Intakes 1-15 spent three years at Wagga while for intakes 16-25, the duration was two and a half years. Subsequently, course duration was staggered depending on the particular trade selected. Apprentices from intakes 1-19 were required to serve a 10-year return of service – a total commitment of 15 years, which was a significant time for youngsters fresh out of school. Number 20 intake (Squirrels, 1966) was the first apprentice intake to sign on for a shorter term of nine years.

There are many tales to be told if one gets an 'appie' aside for a chat. Interestingly, the tales from the earliest to the last intakes have a strong similarity. The rivalry that existed between trades, intakes and adult trainees resulted in rumbles that are legendary and almost every intake has their own version. However, probably the most enduring quality of ex-apprentices is the way in which appies have a strong sense of solidarity, and members from the first to the last intake can, and often do, have a great time together sharing experiences and memories. 🍷

Bruce Hart (instruments), Peter Haxell (electrical) & Harry Howard (instruments), all from intake 19.

• SOURCES: *Us Appies* compiled by Phil Jones; *Indentured In Blue* by George Homer; *From the Ground Up* by Chris Coulthard-Clark.

WELCOME TO SCOOTAVILLE

RAAF Radio School Association has planned a charity motor scooter ride to celebrate the RAAF Centenary. The two-week ride, departing 12 September, will take participants and their motivation crews from RAAF Base Amberley to RAAF Base Townsville via Western Queensland tourist routes through regional centres such as Emerald, Barcaldine and Longreach. Twenty Sym Crox 50cc motor scooters (pictured right) will be provided with two riders assigned to each. A number of service clubs, local councils, Woolworths and IGA stores along the track are supporting the event. Organiser Trevor Benneworth says there are a few spots available for anyone interested in taking part; you don't have to be ex-Radschool and can join as either rider or supporter. For more information, see radschool.org.au/Scootaville.



IFT

A M E R I C A ' S F I R S T S U C C E S S F U L

THE FIRST PROJECTS OF LOCKHEED'S
SKUNK WORKS WERE THE P-80 SHOOTING
STAR AND ITS DERIVATIVES.

CLARENCE LEONARD 'KELLY' JOHNSON joined the Lockheed Aircraft Corporation as a toolmaker in 1933, aged 22. In his 1989 autobiography, *Kelly: More Than My Share of It All*, he recalled the origin of Skunk Works. After designing the P-38 Lightning with Lockheed's chief engineer Hall Hibbard in 1937, Johnson became the company's chief research engineer. He began work on the P-80 jet fighter project in 1943:

For some time, I had been pestering [Chairman Robert E.] Gross and Hibbard to let me set up an experimental department where the designers and shop artisans could work together closely in the development of airplanes, without the delays and complications of intermediate departments to handle administration, purchasing, and all the other support functions. I wanted a direct relationship between design engineer and mechanic and manufacturing. I decided to handle this new project just that way.





Thus, the the Advanced Developments Projects (ADP) enterprise that became known as the Skunk Works was born.

Irv Culver, a self-taught aeronautical engineer, designer and inventor, had joined Lockheed in 1938 as a draftsman. He was one of the engineers handpicked by Hibbard and Johnson for the XP-80 program. A few days into the program, a telephone rang. It was a call from the US Navy intended for Dick Pulver, the project engineer working on the Lockheed XRBO-1 Constitution transport program, but apparently the caller had misdialled. Culver, seated at the desk upon which the telephone rang, answered in jest with: "Skunk Works. Inside man Culver."

Skunk Works was a rundown Dogpatch (backwater) bootleg brewery in the Li'l Abner newspaper comic strip. Kickapoo Joy Juice was brewed there from skunks, old smelly shoe leather and other putrid infusions. Al Capp's comic strip was likely a favourite of Culver's, and he is credited with the naming of the famed Skunk Works.



ABOVE Kelly Johnson, father of the Skunk Works Program



ABOVE RIGHT Chief engineer test pilot Tony LeVier with a P-80A-1-LO. Photo: National Museum of the USAF.



RIGHT P-80A in flight.

P-80 SHOOTING STAR

By early spring 1943, it was apparent that the Bell P-59 Airacomet fighter, America's first and then only turbojet-powered airplane, would never be suitable for combat. A jet-powered fighter was desperately needed to combat the 500mph (800kph) Messerschmitt Me 262 jet in Europe, and the 400mph P-59 wasn't it.

The Engineering Division of the US Army Air Force (USAAF) Air Technical Service Command met with Lockheed representatives on 17 May. Lockheed was invited to present a fighter proposal based upon the use of a single British-designed de Havilland Halford H.1B Goblin turbojet engine. The company reps returned to Burbank and put their key personnel to work on what the USAAF Air Materiel Command called Secret Project MX-409.

On 24 June, a contract was issued to Lockheed for a one-off airplane designated XP-80. The company undertook to produce it in a mere 180 days. Gross, Hibbard and Johnson knew that no company had ever designed and built a prototype airplane in less than a year, let alone six months. Moreover, a turbojet-powered airplane was a radical departure from contemporary piston-powered aircraft.

Gross made Hibbard the overseer of the project, as vice president and chief engineer, and Hibbard established the XP-80 Experimental Group. He appointed Johnson chief research engineer on the

project. Due to the secrecy of the XP-80 program, Johnson didn't file for his patent until 5 June 1944.

To man the top-secret XP-80 Experimental Group, Hibbard and Johnson took 105 of the best personnel they could find from within the corporation. Lockheed's chief engineering test pilot, Milo Burcham, flew a prototype Bell YP-59A in late 1943 at Muroc (later renamed Edwards) Army Air Force base to familiarise himself with turbojet propulsion.

In early November 1943, the XP-80, nicknamed Lulu-Belle, was removed from its assembly area during the night and secretly trucked to the North Base area of Muroc. On day 139 of the project, 12 November 1943, the British Goblin turbojet engine roared to life; but three days later, the engine suffered damage and a replacement had to be shipped from England.

The XP-80 was now scheduled to fly during the early morning of 8 January 1944, 54 days later than originally scheduled. Burcham lifted Lulu-Belle off



and began a climbing turn, but when the wings began to 'wobble' he immediately nosed her down, came around and landed on the dry lakebed. Johnson asked: "What's the trouble?"

"She felt funny on the ailerons. Pretty touchy."

"You've got 15-to-one boost and a hot ship that's naturally sensitive – maybe you were overcontrolling," Johnson said.

"Could be," Burcham agreed.

On the second flight he climbed straight, came around for a low pass across the field and climbed out of sight. Then he came down from high altitude so fast that no one knew he was approaching until he passed overhead doing full aileron rolls, before landing.

"You don't fly this airplane – you just hint to it where you want it to go," he said. "And it really goes."

The handful of USAAF officers in attendance at the XP-80 demonstration flight were both surprised and delighted. They let it be known just how badly they wanted production P-80s – and how very soon.

The de Havilland H.1 Goblin engines were to be manufactured under license in the United States by the Allis-Chalmers Corporation as the J36. But they would not be available in quantity anytime soon. That, of course, posed a serious problem for the USAAF and Lockheed. However, General Electric had sped the development and production on its new Model I-40, or J33, centrifugal-flow turbojet engine.

The J33 was a larger engine than the Goblin and offered nearly 1,300 pounds more thrust, but it required a larger and almost new XP-80 airframe to accommodate it. The USAAF asked Kelly Johnson if it could be done. "Can do," Johnson replied. Thus, P-80 airframes were enlarged and the aircraft redesignated XP-80A.

The XP-80 was later assigned to the 412th Fighter Group for extensive evaluations and then to Air Training Command at Chanute AAF Base, Illinois. After the war it was donated to the Smithsonian Institution, and stored until its restoration by Lockheed in 1978. Today, America's second jet airplane is on permanent display, along with the P-59, in the Smithsonian's National Air and Space Museum in Washington, DC.

After the lone XP-80 came two experimental XP-80As, 13 prototype YP-80As, and a one-off XF-14 (XFP-80). The success of those aircraft led to the production of several operational variants of the Shooting Star including the P-80A, FP-80A, P-80B, and P-80C. (On 10 June 1948, the prefix P for Pursuit became F for Fighter). A reconnaissance version of the F-80C was put into service as the RF-80C.

Of the YP-80As, the third (serial 44-83025) crashed on takeoff at Burbank on 20 October 1944, killing Milo Burcham. Two more were sent to England. Serial 44-83026 was fitted with a prototype Rolls-Royce Nene engine (Model B.41) for flight trials, but crashed during its second flight out of Burtonwood, England, killing its test pilot Major Frederic Borsodi. The second, serial 44-83027, suffered an engine failure on 14 November 1945, and was destroyed in the crash.

Another two YP-80As went to Italy during Operation Extraversion, and both flew operational sorties but never encountered enemy aircraft. Both were shipped back to the United States. One (serial 44-83029) was lost in a fatal crash in Kentucky on 2 August 1945. The other (44-83028) was modified and served as a pilotless drone.

XP-80A SPECIFICATIONS

CREW: One (pilot)

PROPULSIVE SYSTEM: One centrifugal-flow General Electric XJ33-GE-7 turbojet engine

MAX THRUST: 3,825-lbf (5,200 Nm)

LENGTH: 34ft 6 in (10.50m)

WINGSPAN: 38ft 10in (11.83m)

MAX TAKEOFF WEIGHT: 13,78 lbs (6,250kg)

MAX SPEED: 553mph (890kph) at 5,700ft

COMBAT CEILING: 48,500ft

MAXIMUM RANGE: 1,200 miles (1,930km)

ARMAMENT: Six .50-in Colt-Browning M2 machine guns

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ADDITIONAL VERSIONS

The one-off Lockheed XF-14-LO (XFP-80; LO for Lockheed, and P for photo-reconnaissance) was the second YP-80A modified as an unarmed experimental photographic reconnaissance and mapping airplane. On the night of 6 December 1944, it collided with a B-25J Mitchell chase plane over California. Lockheed test pilot Perry Earnest Claypool Jr. and the four-man crew on the B-25J were all killed.

Additional versions of the F-80 were designed and proposed to the USAF, but not developed. In 1948, the F-80D featured a more powerful engine, and the F-80E, featuring 35-degree sweptback wings and tail planes, attained a maximum level speed of 662mph (1,065kph) at sea level.

T-33 'T-BIRD'

The T-33A began life as the tandem-seat pilot training and transition TP-80C variant, of which 20 were built. That aircraft, the Air Force's first dedicated turbojet pilot trainer, was created from a P-80C by inserting a 12-inch 'plug' behind the wings, and a 29-inch plug in front of them. It made its first flight on 22 March 1948 and in May the following year, the type was redesignated T-33A. Eventually 6,557 T-33s were built and the aircraft saw service with some 30 nations. The US Navy's T2V SeaStar was developed from it.

F-94 STARFIRE

The USAF was struggling to find a suitable all-weather/night fighter-interceptor. Since the Lockheed T-33A was already in production, and it was a two-seater with adequate room for the required electronic equipment and weapons, it became a natural choice as a stopgap measure.

The plan was to install the Hughes E-1 fire-control system, Sperry A-1C computing gunsight, AN/APG-33 radar system, and appropriate armament into the TP-80C. Lockheed jumped on the opportunity and, since it was a hush-hush program, management turned it over to the ADP department. In turn, Hibbard gave it to Johnson, who handed it off to James Russell 'Russ' Daniel. Dallas Burger (who later became project



engineer on the F-104 program) served as assistant project engineer.

On 8 October 1948, the USAF issued an official General Operational Requirement (GOR) to acquire a prototype as soon as possible and the Lockheed program was approved by Secretary of Defense James Forrestal the next month. Among the other turbojet-powered all-weather fighter candidates were the North American YF-86D Sabre, Curtiss XF-87 Blackhawk and Northrop XF-89 Scorpion of the USAF, and the Douglas XF3D-1 Skyknight of the US Navy. One other consideration was the North American YF-93A which, for a time, was also a contender in the USAF Penetration Fighter program. The F-86D, F-89B and F3D-1 all entered service but not until, respectively, March 1953, June 1951, and February 1951. The F-87 and F-93 programs were cancelled in 1948 and 1950 respectively.

Lockheed's two YF-94A prototypes did well in flight tests and the USAF ordered it into production. A modified example became the single EYF-94B. The name Starfire was coined by someone in Lockheed public affairs, and it was officially adopted by the USAF for the F-94C; neither the F-94A nor the F-94B were so named. The USAF eventually procured 109 F-94As,

355 F-94Bs and 387 F-94Cs, for a total of 851 production airplanes.

PENETRATION FIGHTER: XF-90

In April 1946, Lockheed was invited to submit a proposal for the USAAF Penetration Fighter program to produce a long-range 'penetration interceptor' capable of attacking defending interceptors in their air space. The resulting XP/XF-90 competed with the McDonnell XP/XF-88 and North American YF-93A. The first of two XF-90s made its first flight in June 1949 at Muroc Air Force Base with test pilot Tony LeVier at the controls.

Both prototypes were redesignated XF-90A after being refitted with afterburner-equipped 4,200 pound thrust J34-WE-15 turbojet engines. The maximum speed attained in level attitude flight by an XF-90A was 0.90 Mach or 668mph (1,075kph).



TOP LEFT TP-80C-1-LO in flight.

ABOVE LEFT T2V-1 Lockheed demonstrator (foreground) with the US Navy T-33B it replaced. Photo: LM Code One.



BELOW Premier YF-94. Photo: USAF.



T-33 SPECIFICATIONS

CREW: Two (student pilot and instructor pilot)

PROPULSIVE SYSTEM: One centrifugal-flow Allison J33-A-23 turbojet engine

MAX THRUST: 5,400lbf (7,340Nm)

LENGTH AND WINGSPAN: As for XP-80A

YF-94 SPECIFICATIONS

CREW: Two (pilot, flight test engineer)

PROPULSIVE SYSTEM: One centrifugal-flow afterburning Allison J33-A-33 turbojet engine

MAX THRUST: 6,000lbf (8,160Nm)

LENGTH: 40ft 1in (12.22m)

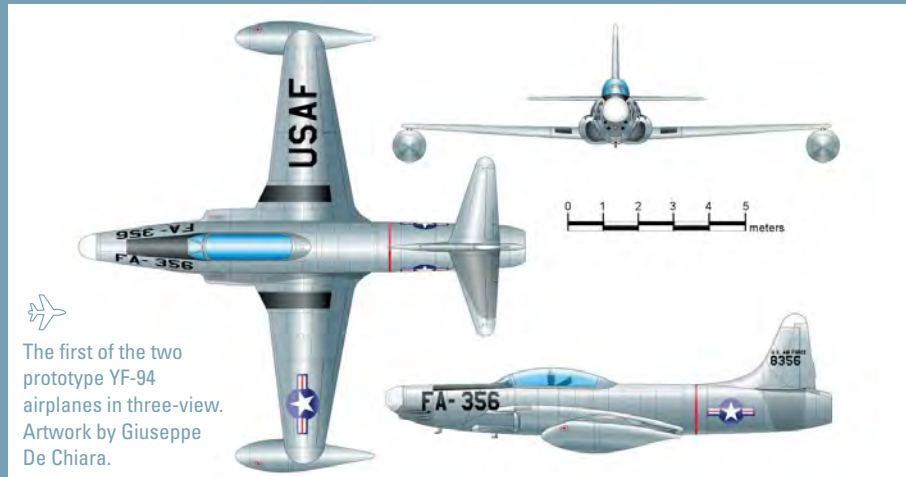
WING SPAN: 38ft 11in (11.86m)

GROSS WEIGHT: 13,000lbs (5,897kg)

MAXIMUM SPEED: 600mph (965kph)

MAXIMUM RANGE: 1,000 miles (1,610km)

ARMAMENT: Four .50-in machine guns



In the event the F-90 did not go into production; instead, McDonnell developed its XF-88 into the F-101 Voodoo penetration fighter-bomber.

SUMMARY

The first year and a half in the life of the Skunk Works gave birth to America's first operational turbojet-powered fighter. By the end of 1944, the P-80A, the Shooting Star, was in mass production. Its unique design lent itself to adaptation to other roles, such as photographic reconnaissance and pilot trainer/transition variants.

The Shooting Star and its offshoots weren't the only aircraft programs the new entity of the Lockheed Aircraft Corporation was working on. Diversity became a way of life. For example, in the fall of 1944 a wholly different type of aircraft was in the works. The TDN-146 would evolve into the Model 75 Saturn, a small piston-powered, propeller-driven, feeder-type airliner.

Skunk Works has since created a vast assortment of machinery, including manned and unmanned aircraft, missiles and rockets, seacraft and spacecraft. Diversity is the biggest factor in its continuing triumphs, and next extracts will examine a few of them. [W](#)

Edited text and photographs are used (with permission) from chapter one of *The Projects of Skunk Works* by Steve Pace (Voyageur Press).

US terminology has been retained, with metric conversions for imperial measurements added, except for altitudes.



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AIR FORCE ASSOCIATION

SETTING THE AUSTRALIAN RECORD



Aussie Invader II on the transporter at the Lake Gairdner camp, 1993.

THE AUTUMN EDITION OF *WINGS* INTRODUCED READERS TO ROSCO McGLASHAN AND HIS PREPARATIONS FOR AN ATTEMPT AT THE WORLD LAND SPEED RECORD. **NEIL SMITH** PICKS UP ROSCO'S INSPIRATIONAL STORY AT LAKE GAIRDNER, SA, WHERE IN DECEMBER 1993, AFTER A 2,500KM ROAD JOURNEY ACROSS THE NULLARBOR, HE AND HIS TEAM SET UP CAMP AND ROLLED *AUSSIE INVADER II* ONTO THE SALT BED.

EMOTIONS RAN HIGH with nervous anticipation of how *Aussie Invader II*'s unique design would perform on the lake, especially considering solid wheels (without tyres) had never previously been used to set a land speed record on salt.

Consistent with prototype risk mitigation, a progressive work-up program was employed, and a faultless first run to 400kph was encouraging. However, as *Aussie Invader*'s speed increased over the next series of runs, its traction diminished markedly and directional control was limited. Achieving a new world record speed would require a better grip on the salt surface. But how?

Rosco McGlashan, the master improviser, was determined to find a way. A spare rear wheel, manufactured with a slight convex V-profile, was fitted in place of one of the front wheels to determine if it would improve controllability. The asymmetric configuration produced an improvement, but it was sub-optimal, and on a run at more than 700kph, the vehicle suddenly veered off course 45 degrees. Rosco's quick reaction to deploy both brake chutes brought him back on course and saved the day.

Team determination and enthusiasm was such that of all the ideas that were tossed around as to what should happen next, none included packing up and going home. However, Mother Nature had other ideas. A massive low-pressure system was heading in from the south, giving the team only an hour to pack up and get the car and themselves to safety before being hit by 150kph winds.

Next morning, the team despaired at the sight of the marquee, that was the car hanger, lying twisted and broken and flapping about like a beached whale in ankle deep water that covered the lake. The only option was to go home, overcome the disappointment and regroup. Indeed, Rosco was already making plans for a return as soon as possible.

SECOND ATTEMPT

Back in Perth, the wheels were re-profiled, the car was given a thorough service and long-range weather forecasts were again studied. *Aussie Invader II* returned to the lake in March 1994; strained finances necessitating a minimum support crew.

While there had been no rain on the lake since December, the team was dismayed to find that prevailing northerlies had moved surface water from some 50km up the lake to cut the 20km race track between the 4km and 7km points. Now, with only 13km of track to work on, a world land speed record looked to be out of the question. However, test runs of 400kph and 700kph proved the wheel modifications effective, and a serious attempt at setting the Australian Land Speed Record was planned with the timing markers at 10km and 11.6km, limiting the braking distance on return runs to 3km before encountering an expanse of 60mm-deep water.

The first run north recorded a speed through the measured mile of 770kph and the biggest smile yet to break on Rosco's normally furrowed features. Within the prescribed hour, *Aussie Invader II* was turned and set south at a similar blistering pace.

Exiting the measured mile, with the shortened stopping distance demanding

brake chute deployment at a higher than desired speed, both parachute straps snapped. *Aussie Invader II* hit the water at over 500kph, tearing the floor panels from the car. Salt water was everywhere, Rosco was soaked, yet he smiled; he knew it was a fast run and quipped: "We probably set a new water speed record as well". But what he did not know at the time was that the 10km timing trap had not registered the return run. Both runs were therefore meaningless and the car was damaged.

A feeling of despair descended on the team, except for the indomitable Rosco. Three days later, repairs had been made to both the car and the timing trap, and the timing markers moved to the mid-point of the 13km track. Then the huge blue monster hurled itself angrily across Lake Gairdner: northbound at 814kph, then southbound at 790kph for an average speed of 802kph – 155kph faster than Donald Campbell's 647kph record set in 1964. Australia had a new, home-grown Australian land speed record holder whose achievement still stands. It is also the only land speed record ever set on solid, tyreless wheels on salt.

The world record however, was still out of reach. Faster runs were out of the question on the water-shortened track, and with no chance of the lake drying out within a week and funds and provisions running low, there was no point staying. So it was home again for the team.

THIRD ATTEMPT

The next attempt was planned for February 1995. During the intervening year, *Aussie Invader II* was stripped and cleaned thoroughly, all systems checked for salt damage and a larger fin designed and installed to improve directional stability.

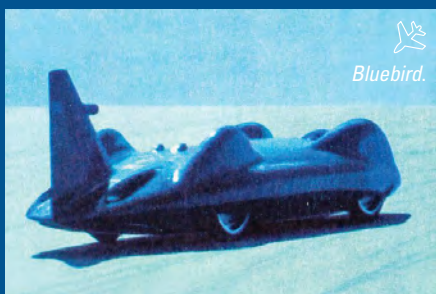
But sometimes it seems that supernatural forces conspire to thwart honest endeavour, and that appeared to be the case in February 1995; Rosco's team named it the "Spirit of the Lake". Rain fell on the lake two weeks before the team was due to arrive, and a severe squall hit the camp the day after setting up. The salt was wet, introducing



Original wheels in the foreground; note the slight convex V-profile on the two wheels at the rear.

WORLD RECORD BREAKERS

In 1964, Donald Campbell, driving *Bluebird*, set the world and Australian land speed record at 647kph. Campbell's achievement ignited then 12-year-old Rosco's life-long mission to capture the world land speed record for Australia and become the fastest man on Earth.



In the 1990s, *Thrust SSC* was developed by a British team of engineers led by the extant world land speed record holder Richard Noble. Specifically designed for supersonic speed, it was powered by two afterburning Rolls-Royce Spey turbofan engines delivering a total thrust of 50,000 lbf (220kn).

Thrust SSC's driver on the record-setting run was RAF fighter pilot Wing Commander Andy Green.



a tramlining hazard where the rear wheels could easily drop into one of the front wheel ruts and make it nearly impossible to steer out and proceed under control. However, with hints of sponsorship dollars drying up, Rosco had to give the attempt his best shot.

On the first run, it was discovered that *Aussie Invader II* was veering left after about five seconds of afterburner thrust. With the tramlining hazard materialising, the car veered off course and ingested a rubber witch's hat into the engine at some 500kph. Fortunately, engine damage was minimal and confined to the compressor inlet guide vanes.

The persistent veer to left was thought to be caused either by misalignment of the afterburner nozzle or the new tailfin. Following nozzle adjustment and a check and recheck of the tailfin for proper alignment, the next run went as planned; straight as a die. However, the very next run saw the car again veer left in soft salt and 'head for the hills' where it ended bogged to the axles in the soft crust and underlying mud that surrounds each of the islands.

It took 16 gruelling hours to extract.

Rosco believed he overcorrected early in the run, losing the line and actually steered the car left. As no other explanation was evident, another run was planned, but something had to go right, and soon, because the weather was looking threatening again.

The northbound run went well, 800kph plus, and Rosco was feeling confident the car was set for a 1,000kph run. However, the engine refused to start, and the mandatory hour for turn-around was lost. Nonetheless, Rosco decided to complete the southbound run, which started well: for 3km the car ran straight, then the all-too-familiar veer to the left, only gradual but sufficient to put *Aussie Invader II* in line with the timing marker stands.

Rosco realised the problem and cut power at over 800kph, just as the car hit a 20mm solid steel framed timing stand. The timing transmitter and battery were ingested and the engine ruined. The 20mm steel bar tore at the body and stripped away a dozen panels of fibreglass. This time the race was run ...and lost. With nothing further



Rosco with Aussie Invader III on the salt.

that could possibly be done, they went home – again.

AUSSIE INVADER III

Meaningful information had been gained over the three attempts. Importantly, the cause of the persistent veer left was found to be expansion of the afterburner canal causing side mounts, which had been added to accommodate the fin modification, to misalign the engine. Moreover, the telemetry which sent operational data from the car to a land-based computer revealed the car actually created 11 tonnes of downward force over the front wheels at 800kph, and that needed to be reduced.

With all that *Aussie Invader II* had been through, it was decided it would be easier to build a new car. Major modifications were made to the tubular chrome-molybdenum frame, reducing some 600mm from the front as well as making the body more rounded with less flat surfaces, and a new, one-piece, fibreglass body was built with Kevlar carbon fibre reinforcement around the cockpit. A new livery, new shape, new engine, and *Aussie Invader III* was born. After thousands of volunteer man-hours, she looked and felt fantastic, and an aura of goodwill and renewed optimism enveloped the team.

Logistics for the new attempt would be different. No more travelling the 'Big Paddock' (Nullarbor) loaded down with tonnes of food and equipment. This time a semi-permanent camp would be set up at the lake's edge. Eleven disused covered truck bodies were converted to sleeping quarters, mess,

kitchen, storeroom and workshop, with everything donated and transported to the lake in February 1997. A caretaker was appointed and the long wait for the right conditions began.

But time was running out because a revolutionary new British design capable of supersonic speed, *Thrust SSC*, was undergoing tests in Jordan (see side panel, page 52). Not to worry, Rosco always believed he would get there in three stages; Aussie record, world record and then the sound barrier, ever hoping that the Brits would take a further year or more to be race ready.

As soon as the salt conditions were right, with no rain in sight, a core crew would fly to South Australia, prepare the car and start running some good speeds around 1,000kph. Then call in the officials (who would be on standby) and get that world record, hopefully at supersonic speed. The first man to break the sound barrier on land would go down in history, and Rosco desperately wanted to be that man.

But the Spirit of the Lake prevailed. It rained and rained, month in, month out. The lake never was in all that time, even for a fleeting moment, suitable to run on. Then in October of 1997, the news they dreaded arrived: *Thrust SSC* had broken the sound barrier and set a new world land speed record of 1,227kph.

So where did that leave Rosco and his land speed challenge? That question will be answered in the spring edition.

Neil Smith, MD RAAFA Publications, with the assistance of the Australian Land Speed Challenge team.



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QANTAS

IN THE THIRD OF OUR FOUR-PART SERIES,
WE LOOK AT QANTAS DURING WORLD WAR II.

AT WAR





LEFT Qantas Catalina, Koggala Lake, Ceylon, circa 1943.



Corio at anchor, Pinkenba, Brisbane.



BY 1939, QANTAS had normalised its operations, consolidating its existing regional routes while expanding into the new world of international operations. Single and multi-engine biplanes still serviced the outback, but now seemingly gargantuan Empire Flying Boats graced Sydney Harbour, offering opulent service for the emerging demand for air travel between England and Australia. Qantas had come of age. However the dark clouds of war in Europe were now casting shadows across its ever-broadening wings. An airline born out of war, began to dig-in for an uncertain future.

STORMING: THE TRUE SPIRIT

From its beginnings, Qantas had known war. Founders Paul McGinness and Hudson Fysh were Gallipoli veterans and aviators of the 1st Squadron, Australian Flying Corps (AFC). Decorated for bravery and revered for their prowess in the sky, Fysh received the Distinguished Flying Cross and McGinness was awarded both the Distinguished Conduct Medal and the Distinguished Flying Cross, a combination rarely awarded to a single individual.

Arthur Baird, employed in 1921 as chief engineer for QANTAS, had served in the AFC alongside Fysh and McGinness, repairing and servicing their bullet-ridden biplanes in the Middle East. Even Sir Fergus McMaster, the financial brains and

first chairman of the airline, had known combat. Aged 37, he signed up for the AIF and served in France at Villers-Bretonneux as a gunner and dispatch runner. On the decision to use the acronym QANTAS, McMaster later said it was selected in part because it reminded people of the acronym ANZAC.

As Europe began its descent into the darkness wrought by Hitler and his expansionist ideals, Qantas initially remained largely unaffected. The newly consolidated Qantas Empire Airways (QEA) partnership, however, became concerned about operating through southern Europe due to the unknown state of Italy's wartime intentions, and British crews (who operated the route as far as Singapore) were forced to alter their route south. Though adding many hours to the journey, the longer track via the west coast of Africa, Durban, Cairo and Karachi (dubbed the Horseshoe Route) offered a safer pathway.

With the entry of Japan into the war, a new and very real threat to Australia, and Qantas' existence as a commercial airline, emerged. Under the terms of the QEA agreement, Qantas crews only operated the Empire Flying Boats from Sydney's Rose Bay to Singapore. There, the aeroplane, its mail, freight and passengers, would be handed over to the Imperial Airways crew who would continue the service to Croydon in London. Singapore was a major strategic base, supporting aircraft maintenance,

spares, scheduling and passenger handling. Passengers would enjoy an overnight stop in Raffles Hotel before continuing on to England or Australia. All that changed in the pre-dawn hours of 8 December 1941 as 17 Mitsubishi bombers of the Imperial Japanese Navy began a bombing raid on Singapore.

Aware of the unstoppable march of the Japanese, Qantas began to prepare for the eventual withdrawal of services to London. Initially, the operation was rerouted further south through Batavia (now Jakarta), but eventually the Empire Flying Boats were forced to cease all flights to England and increasingly began extraction flights back to Darwin and Broome. Throughout the early weeks of 1942, Qantas captains flew hair-raising 'hide and seek' games in the sky with the Japanese, even conducting refuelling operations during air raids. On 30 January, the situation came to a head, and their luck ran out.

Captain Koch, in command of the flying boat *Corio*, was en route between Darwin and Surabaya to evacuate women and children when the aircraft came under attack from seven Japanese fighters. As bullets ripped through the fuselage, Koch opened the throttles, pushed over into a steep descent and made a run for a nearby beach. Two engines were now on fire and Koch was losing control of his aircraft. Landing heavily in the sea, *Corio* nosed over and sunk to her wings five miles short of land. Koch was thrown clear through the windshield and after doing what he could for the survivors, began the long swim to the beach to search for help. Of the 18 passengers and crew, only five survived. Radio Officer Patterson, Purser Cruickshank and Flight Steward Elphick perished along with 10 passengers before rescue arrived.

Just three weeks later, on 19 February, more than 180 aircraft launched from the Imperial fleet attacked Darwin and its harbour. Among the 50-odd vessels in the harbour sat the flying boat *Camilla*. After the first raid ended, Captains Crowther and Hussey reached the harbour to find *Camilla* virtually unscathed and, following a hasty pre-flight, managed to fly her away before the second wave of bombers arrived. Later in the day, they returned in the flying boat to rescue survivors.

Like much of Darwin, the main Qantas hangar had been bombed leaving just some superstructure standing. At the time of the raid, some 24 staff were on station, including the ill-fated Captain Koch who had been lying in Darwin base hospital recovering from his ordeal in *Corio*.

After the fall of Singapore and the decimation of Darwin, the centre of flying boat operations was transferred to Broome, under the direction of Captain Lester Brain. Qantas was not the only operator in the area, the challenging waters surrounding Broome with their 10m tides were home to more than 50 flying boats of both civil and military origin including Dutch and American aircraft.

Upon the request of the Director General of Civil Aviation, Qantas continued evacuation flights between Broome and the Indonesian island of Java. By late February, Empires were flying hundreds of kilograms of munitions into the war zone and returning with evacuees – work that put the civil crews directly in the way of the advancing Imperial forces.

The work however, was short-lived. The relentless march of the Japanese meant flights into Java were becoming increasingly dangerous. On 28 February, Captain Brain dispatched the two final mercy flights from Broome. *Corinthian* returned safely with its humanitarian load. *Circe*, under the command of Captain Purton with four crew and 16 passengers, came under fire from a lone Mitsubishi twin-engine bomber some 320km south of Java and was lost at sea.

Three days later, Broome, its airport and seaport in Roebuck Bay came under attack. Around 9am on the 3 March 1942, Japanese Zeros destroyed 15 flying boats at anchor. Almost simultaneously

Corinna, being loaded with 25 passengers bound for Port Headland, and *Centaurus*, on charter to the RAAF, came under fire. While hundreds of lives were lost during the raid, all of *Corinna*'s passengers and Qantas staff survived the raid. Both QEA Empires however, were among the flying boats destroyed, and today remain in their watery graves.

Of the 10 Empire flying boats operated by QEA, four had been handed to the RAAF and were mostly flown by Qantas crew who had signed up for the war effort. Five Flying Boats were lost in March. *Centaurus* was destroyed in the air-raid on Broome, while *Coogee* had been damaged beyond repair during a landing accident in Townsville. Of the Qantas fleet, *Corio* had been shot down, *Circe* was missing at sea and *Corinna* had been sunk in Broome harbour. The Air Force still commanded two Flying Boats while QEA had just three of its original fleet of 10 still flying. Within another month, *Corinthian* (in service with the military) would be destroyed on landing in Darwin and *Camilla* (still flying for QEA) would be laid-up due to substantial damage from its work on rescue flights. The jewel of the airline's operation was effectively gone, along with the lives of many crew and passengers.

With smoke billowing from the burning wrecks in Roebuck Bay, the air route to England was severed and any rational thought of restarting the service evaporated. Japan now controlled most of the territory to the north-west of Australia and Japanese reconnaissance aircraft and submarines patrolled the Indian Ocean. Contact with London was now seriously hampered. The only way to get to England was via the United States – a long journey at a time when



Darwin hangar after the bombing.

communications were vital. Re-enter the indefatigable Hudson Fysh.

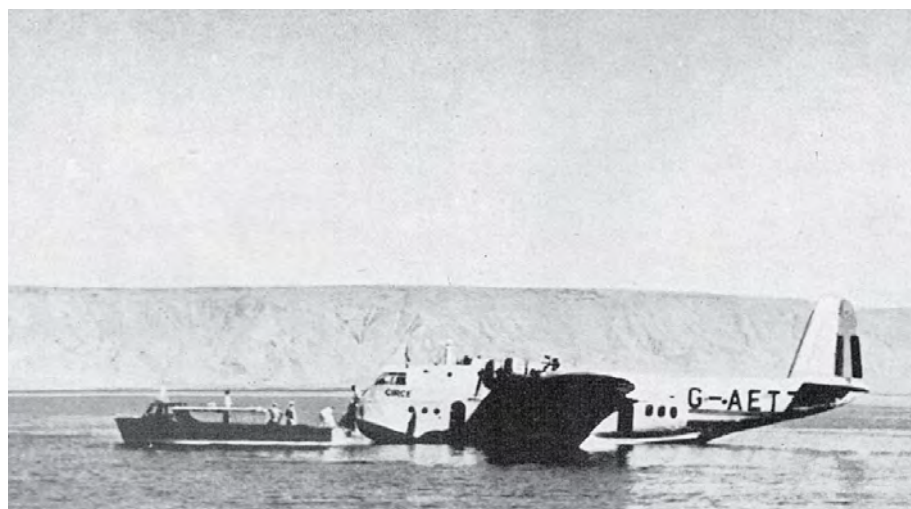
From Fysh's point of view, continuing the service to England was imperative for two reasons. Firstly, to re-establish the carriage of vital war cargo and mail, and secondly, to maintain Qantas' stamp on the route in readiness for passenger services when the war ended.

For now, though, Qantas' main task was to continue flying its remaining fleet wherever they were needed and provide whatever help it could to the war effort. Two Empire Flying Boats maintained a service between Darwin, Sydney and Noumea, while the venerable DH86s continued a more or less domestic service throughout the eastern states. Meanwhile, Qantas engineers were kept busy servicing and repairing military aircraft, as well as the airline's fleet. In Rose Bay, which had been taken over by the RAAF two years earlier, Arthur Baird's team was in charge of keeping flying boats of all types including Seagulls, Walruses, Sunderlands and the ever-depleting fleet of Empires, airworthy. In Brisbane, engine overhaul workshops at Archerfield saw unprecedented activity. By war's end, almost 1,000 men and women had serviced and rebuild some 390 aircraft engines, mostly Pratt and Whitney Wasps and Wright Cyclones.

Lester Brain and Fysh discussed the possibility of operating PBV-5 Catalina Flying Boats across the Indian Ocean between Perth and Ceylon (Sri Lanka), to connect with the still viable 'Horseshoe Route' to London. Brain had



Darwin burning with *Camilla* just visible at the right of the smoke.



ABOVE Lester Brain inspecting bullet-ridden piece of Darwin hangar.



ABOVE RIGHT *Circe*.

delivered 19 Catalinas from the US to Australia for the RAAF in January 1941 and was impressed with the aircraft's remarkable range capability. The RAAF needed the PBV-5s for reconnaissance along Australia's vast coastline and had requested Qantas' assistance to deliver the aircraft, given their unique expertise and experience with long over-water flying. In fact, the first Catalina to arrive from San Diego piloted by Lester Brain and Scotty Allan, became just the third aircraft to make the trans-Pacific flight after the *Southern Cross* and *Lady Southern Cross* flights of 1928 and 1934.

After months of planning, Fysh decided the idea of crossing the Indian Ocean from Perth had real merit. On 16 March 1943, a little over a year after the Broome attack, Fysh departed on a USA Transport Liberator for San Francisco, and eventually London, to make arrangements to re-establish the

Australia to England air route. By early April, Fysh was in London meeting with anyone who would give him an audience – the Director General of Aviation, the Chairman of BOAC, Diplomats, Politicians and heads of the RAF and Ferry Command. For a time, his efforts fell on deaf ears, but gradually his arguments gained traction. Finally, after four months of negotiations, an agreement was reached with the Air Ministry for the Lend-Lease of five Catalinas to Qantas to commence a trans-Indian Ocean service between Perth and Ceylon, with the first service to depart on 10 July 1943.

Despite meticulous planning, the trans-Indian Ocean flights carried risks that today would seem unreasonable, but 1943 was a different time. The Catalinas, for example, initially arrived with the necessary extended range fuel tanks, but no ability to dump fuel in an emergency. Based on RAF experience,

'A Gathering of Eagles'

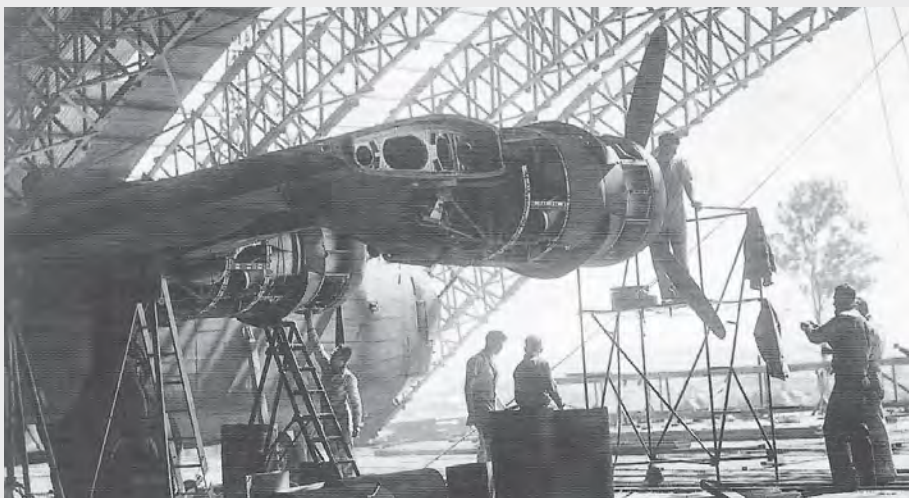


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a decision was made in conjunction with the civil aviation authorities to increase the maximum take-off weight from 29,000lb (about 13,000kg) to a massive 35,000lb (16,000kg). The increased weight limit allowed carriage of the enormous fuel load necessary, while anything unessential was stripped from the aircraft. Though the Catalina could get airborne at that weight, it could not maintain height with a failed engine until enough fuel had been consumed and weight reduced. For the first 11 hours, the Catalinas and their crew pinned their lives on both engines operating smoothly. Later, dump valves that allowed the crew to quickly reduce weight in an emergency were incorporated.

The Catalinas carried the names *Altair Star*, *Vega Star*, *Rigel Star*, *Antares Star* and *Spica Star* for five of the major celestial navigation beacons that would be used to navigate the 30-odd-hour



TOP US B24 under repair at Archerfield, Brisbane.

ABOVE *Altair Star* arriving in Ceylon.



OPPOSITE TOP Certificate given to passengers of the Double Sunrise flights.

OPPOSITE Volunteer crew and 707 operating a Skippy Squadron flight.

odysseys. By day, smoke bombs were dropped to the ocean, allowing the navigator to observe and apply wind drift to his calculations. Such techniques were common practice, but with no landmarks to confirm their position, the merest error could mean the difference between life and death. It was the art of mathematics in its most beautiful form.

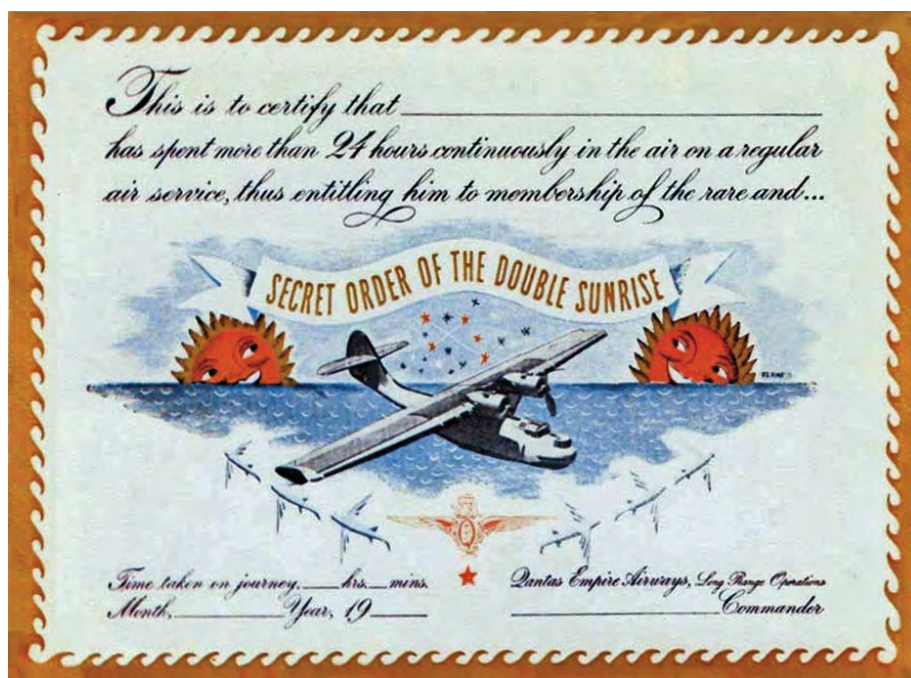
To avoid detection and allow continued operation of the secret weekly flights, the crew would disappear over the ocean in total radio silence. The captains and first officers took turns hand-flying the Catalinas, sometimes no more than 1,000 feet (300m) above the ocean by day and night, and occasionally caught a few hours' sleep to recuperate from the unending loud drone of the engines and the mental and physical fatigue of flying the aircraft.

The crew knew the risks they were taking, including what would happen to them if forced down and captured. Despite Fysh's attempts, the crew were not recognised in the same way as Mercantile Marine sailors. They were civilian crew, flying unarmed military type aircraft carrying war materials and war personnel in enemy airspace. If caught they would most likely have been executed. When back in Australia, the crews of the secret flights just appeared as young healthy individuals who were not pulling their weight for the war effort, and had to endure white feathers and the taunts of cowardice in silence.


In the two years until the end of the war, the Catalinas and their crew flew 271 successful crossings of the 5,600km route between Perth and Koggala Lake, carrying 858 passengers and over 41 tons of freight without loss of a single life or aircraft. Dubbed the 'Order of the Double Sunrise', the flights averaged more than 30 hours and, on 30 August 1943, *Vega Star* set a still-unbeaten record of 32 hours and 9 minutes. After the war,

FASCINATING INSIGHTS

In selecting the title for this article, the author wishes to acknowledge and honour the book by Sir Hudson Fysh, *Qantas at War*, first published in 1968. Though not the only reference for this series, Fysh's trilogy provides a firsthand historical account of the airline that he and Paul McGinness founded, and offers fascinating insights into Qantas' history.



the Catalinas were towed out to sea and sunk under the terms of the Lend-Lease agreement, leaving just the historical records to tell the story.

As this article has focused on the more noteworthy Qantas operations during WWII, much has been left unsaid. What does remain is to acknowledge the 21 staff killed in direct action during the war and the further 10 crew killed in Air Force operations while on furlough from the airline. Their legacy is the continued readiness of Qantas to support Australia in times of need. Between 1965 and 1972 Qantas volunteer pilots and cabin crew conducted 300 return flights between Sydney and Saigon ferrying young men to Vietnam and returning wounded souls to their homeland. The 707 aircraft of the 'Skippy Squadron' had to receive military escort in and out of Vietnam's airspace in case of an enemy attack. In 1974, Captain Don Howe took off from Darwin's cyclone ravaged airport in a Qantas 747 carrying 674 passengers and 23 crew in a world-record flight as part of the evacuation following Cyclone Tracy. From the 2005 evacuation flights following the atrocity of the Bali bombings to repatriation flights of Australians home from COVID-19 ravaged corners of the world, Qantas and its crews continue to support and assist whenever and wherever it is necessary. For many, this culture of 'storming', is the true Spirit of Qantas. 

To be continued next edition.

*Don Hill, Qantas Pilot &
Director, Qantas Founders Museum*

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- P2V-7 Neptune (A89-273)
- Douglas C-47 (A65-94, A65-95, A65-90 - now N2-90)

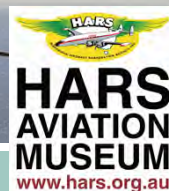
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Consolidated PBV-6A Catalina and C47 Dakota. Photo: Dick Simpson



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INSPIRING STORIES



THE POWER BEHIND
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AND SUCCESS IS
ITS PEOPLE AND
THE QANTAS
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IS COMMITTED TO
PORTRAYING THEIR
STORIES.

QANTAS FOUNDERS MUSEUM is a not for profit organisation in Longreach, Queensland, a small town of 3,000 people 1,200km north-west of Brisbane. The museum is not owned or operated by Qantas, but maintains a great working relationship with the airline. It is an award-winning attraction with more than 40,000 visitors a year and, like many museums, it was started by a small group of enthusiasts who, with the support of the community, wanted to articulate their region's history.

While Longreach and Western Queensland have a proud and diverse history, the town's role in the establishment of Qantas is extraordinary.

A community meeting in 1988 set things in motion and in 1996, the museum opened with an ambition "to enthral and inspire all with the vision, determination and deeds of the QANTAS Founders and those who have followed".

When the Queensland and Northern Territory Aerial Services (QANTAS) was registered on 16 November 1920, its office was noted as Winton, 180km north-west of Longreach. Qantas held its first board meeting in Winton in February 1921 and decided to move the company's main operations to Longreach where the rail head was, at the time. While Qantas provided charter flights and joy rides in 1921 and 1922, its first scheduled flight took place on

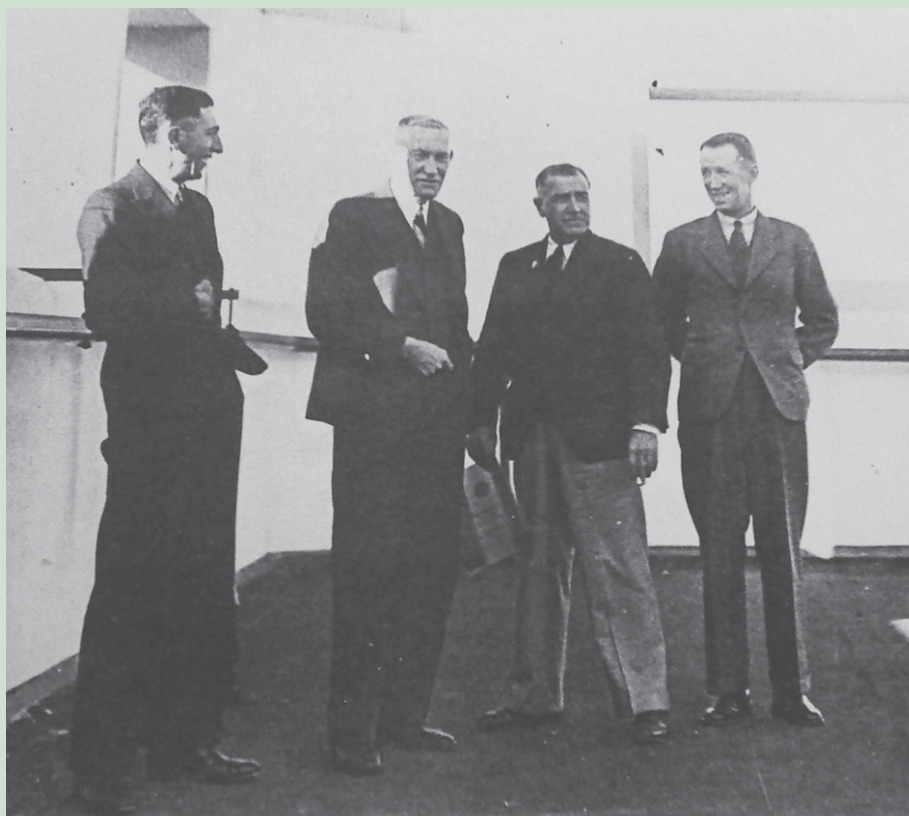
2 November 1922 between Charleville and Longreach and its first scheduled passenger flight on 3 November 1922 from Longreach to Cloncurry.

The idea for an airline was first discussed by World War I veterans Hudson Fysh and Paul McGinness in late 1919 while they were surveying landing strips for the government between Longreach and Darwin in preparation for the participants in the 1919 Air Race. (That story was told in 'The drive that started an airline' in the spring 2020 edition of *Wings*).

On returning from their surveying trip, Fysh and McGinness spent the next year working to convert the idea into reality. The assistance of influential people such as war veteran, grazier and businessman Fergus McMaster, was invaluable in raising capital and support for the fledgling airline. Once registered, the company's first employee was mechanic/engineer Arthur Baird, whom Fysh and McGinness met in Palestine with the Australian Flying Corps.

It is those four men, Fysh, McGinness, McMaster and Baird and their role in the formation of Qantas that the museum pins its story on.

On entering the main exhibition hall at Qantas Founders Museum, attention is immediately drawn to a green biplane, a full-size replica of the first aircraft owned by Qantas, an AVRO 504K. That and many of the museum artefacts provide a perfect introduction for all visitors to understand that the Qantas Airways we know today had very modest and basic beginnings, in fact the airline nearly didn't make it at all.



OPPOSITE Boeing 747, 238 VH-EBQ
City of Bunbury in the Airpark.



ABOVE Hudson Fysh, Fergus McMaster,
Arthur Baird and Paul McGinness.



BELOW The 1922 National Heritage-listed
Qantas Hangar.



Around the exhibition space, the four founders of Qantas, are introduced.

Hudson Fysh, a Tasmanian wool classer who fought in Gallipoli and Palestine in World War I and when the war ended, learnt to fly. Hudson piloted the first scheduled passenger flight, held the position of managing director for 34 years and chairman for another 19 years.

Paul McGinness, a Victorian and one of few to survive an advance on "the Nek" in Gallipoli, went on to join the Australian Flying Corps (AFC) and become an ace pilot where he, along with Fysh, an observer in the AFC, each earned a Distinguished Flying Cross for their contributions. During that time, McGinness wrote to his mother and discussed the potential for a career in aviation after the war. Although McGinness left the company shortly after its formation, his imagination and passion were essential to the early development of the business.

Arthur Baird, another Victorian, completed a five-year apprenticeship as a mechanical engineer and trained as an aircraft mechanic. He also served in the AFC in Palestine and was one of

only five squadron mechanics awarded a Meritorious Service Medal. Baird was instrumental in establishing the high safety culture that Qantas retains today.

Fergus McMaster, the oldest of the four, had served in France and led the fledgling business as its first and third chairman. He also nurtured the political and financial support necessary to ensure its establishment and survival.

SETTING THE SCENE

Surrounding the exhibits honouring those four men are dioramas that set the scene of outback Queensland in the 1920s. Despite the isolation and remoteness, the region consisted of thriving and prosperous agriculture-based communities. The tyranny of distance is part of outback Queensland life and business, especially during the wet season, aviation, promised to change life for the better and communities and their businessmen were eager to support it.

One example of that eagerness was exemplified by grazier Alexander Kennedy who purchased 250 shares in the new aviation company on the condition that he be its first passenger. Kennedy was a member of the airline's provisional board (up to February 1921) and a guarantor for a quarter of the company's first bank overdraft, an incredible risk on such a new form of transport. Qantas satisfied Kennedy's condition by flying him from Longreach to Cloncurry on 3 November 1922, five days short of his 84th birthday.



Regular air services reduced travel times across the state and museum visitors are introduced to the life-changing effects of air travel through early passengers such as Ivy McLain who lived in Cloncurry. In November 1922, Ivy was about to start a nursing job in Brisbane. Rather than endure a seven-day journey by train via Townsville, she was able to fly to Charleville and catch the direct train to Brisbane in just two days. Ivy's father thought that was a much better option for his 23-year-old daughter.

To gain a feel for air travel in the 1920s, museum visitors can view passenger tickets and pamphlets or, better still, climb into the cabin of a De Havilland DH-50 or DH-61 and experience the 'comfort' of those vintage aircraft. Guests can also glean a feel for the pilot's job from logbook records and aircraft artefacts such as engines, and can even test their flying skills in the museum's Bristol fighter simulator.

Museum exhibits also illustrate the rudimentary medical services available to remote Queensland communities in the 1920s and the associated issues.

The arrival of the DH-50 with an enclosed cabin was a game changer for the Australian Inland Mission's Aerial Medical Service, which eventually



ABOVE De Havilland DH-50 replica in the Heritage Hanger.



BELOW LEFT Avro 504 engine.



TOP RIGHT Iconic Qantas aircraft Lockheed Super Constellation parked behind a Boeing 707 in the AirPark.

ABOVE RIGHT Avro 504K replica in the main museum.

became the Royal Flying Doctor Service. Qantas chartered both its aircraft and pilots to the medical service.

Interactive touch tables introduce visitors to some of the other early Qantas staff such as the first manager Marcus Griffin, who organised the company's scheduled routes, and pilot Fred Huxley who, with the help of head and tailwinds, held the records for the fastest and slowest trips from Charleville to Longreach.

The museum's award-winning McGinness' Restaurant has views of the Longreach airport, a Catalina model aircraft flying overhead and meals served on Qantas tableware. Popular meals include the "Hudson Fysh of the Day" or the "AVRO Open Steak Sandwich".



HERITAGE HANGAR

To really understand the working conditions of early Qantas staff, a visit to the 1922 National Heritage-listed Qantas Hangar will take you back in time. The museum has restored the building, one of the oldest civil aviation buildings in Australia, to resemble life and work in the 1920s with workshops, equipment, replica DH-50 and DH-61 aircraft and displays explaining how Qantas built its own aircraft from 1926-1929 or how the company overcame flying at night. It is a thrill to stand on the same 1924 concrete that the early workers and passengers stood on or on a hot summer day, appreciate the uncomfortable working conditions of the early days.

One display in the hangar, consisting of twisted rusty metal tubes, relates the story of a DH-86, an aircraft purchased to operate the first overseas Qantas flight. Unfortunately, all that changed one November morning in 1934.

The aircraft took off from Longreach and was last seen in a spin before crashing on a property near Ilfracombe, 25km east of Longreach. All four souls on board were lost and later investigations by Arthur Baird found a fault in a tail fin that eventually grounded all DH-86 aircraft and Qantas commenced its overseas service with the DH-61.

ICONIC AIRCRAFT

In 2002, Qantas gifted the museum retired Boeing 747-200, VH-EBQ *City of Bunbury*. That aircraft inspired the museum's mission to acquire iconic Qantas aircraft including a DC-3, VH-EAP in 2005, Boeing 707-138, VH-EBA (the first jet Qantas ever owned) in 2007, a Catalina PB-6A (not Qantas owned) in 2009 and a Lockheed Super Constellation (not Qantas owned) in 2014.

With the Boeing 747's arrival, the museum evolved the timeline of the historical presentation from the early 1920s to present day. The later aircraft evoked the experience of commercial flying from the 1940s to the 1970s and introduction of the Jet Age. The Catalina purchase in 2009 was particularly important. Although it was never owned by Qantas, it was restored to resemble Qantas Catalinas that flew the daring 'Double Sunrise' flights in 1943-1945.

After Japan invaded Singapore in 1942, the Double Sunrise route from Perth to Ceylon (now Sri Lanka) was conceived to restore the Australia to United Kingdom link. The Catalinas departed before dawn from the Swan River and flew for an average of 30 hours to Lake Koggala. The aircraft was unarmed and the crew flew in radio silence except for a routine midnight weather report.

The Double Sunrise story is little known in the broader community and museum visitors are now able to view the aircraft and experience the in-flight environment through an audio simulation including the roar of the engines and intercom chatter among the crew. While only five-minutes long, the simulation provides an appreciation of the conditions and discomfort experienced by the crew and passengers on a Double Sunrise flight.

The museum's Super Constellation, restored in late 2019, was another important chapter in the Qantas story, as the 'Connie' introduced a pressurised cabin and women to the cabin crew for the first time. The museum display provides an opportunity to explore a Qantas Super Constellation cabin and learn about those iconic dolphin-shaped aircraft. The aircraft's small cockpit, compared to today's commercial

airliners, enables visitors to appreciate how cockpit's have changed not only in their instruments and technology but in the crew and their responsibilities.

UNDER COVER

Last year, marked the start of major changes to the museum experience with completion of a \$14.3 million Airpark roof and a new Luminescent Longreach night experience. The Airpark roof, which began construction in September 2019 and opened to the public on 1 July 2020, was designed to provide a cover for the Boeing 747, Boeing 707, Super Constellation and DC-3 aircraft, and protection for museum guests, from the Longreach weather especially in Summer.

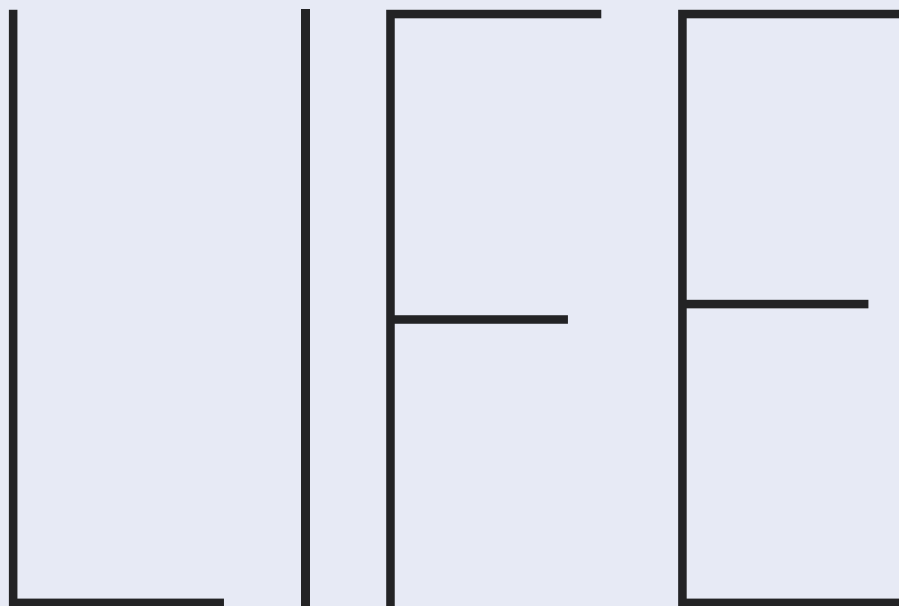
The project also created the spectacular Luminescent Longreach night experience. A 20-minute show witnessed from among the museum's iconic aircraft, as world class projection using the Boeing 747 as a primary canvas and 360 degree immersive sound dynamically articulates the 100-year story of Qantas.

To celebrate the Qantas centenary, the museum planned several events between November 2020 to November 2021. It is also looking to future anniversaries such as the centenary of the construction of the Longreach Qantas Hangar (August 2022) and a celebration of the first scheduled flights for Qantas (November 2022).

While the museum has grown from a small community enterprise, its connection to community has always been important. Every year the museum hosts over 20 free community events including exhibition launches, musical concerts, children's school holiday activities and morning teas. Qantas Founders Museum also provides sponsorship to its community through raffle prizes, free room and equipment hire and financial support. **M**

• *The Qantas Founders Museum is open every-day except Christmas Day and Boxing Day. For opening hours, prices, tours, events and more, go to qfom.com.au, phone 07 4658 3737 or email info@qfom.com.au.*

THE SEESAW OF



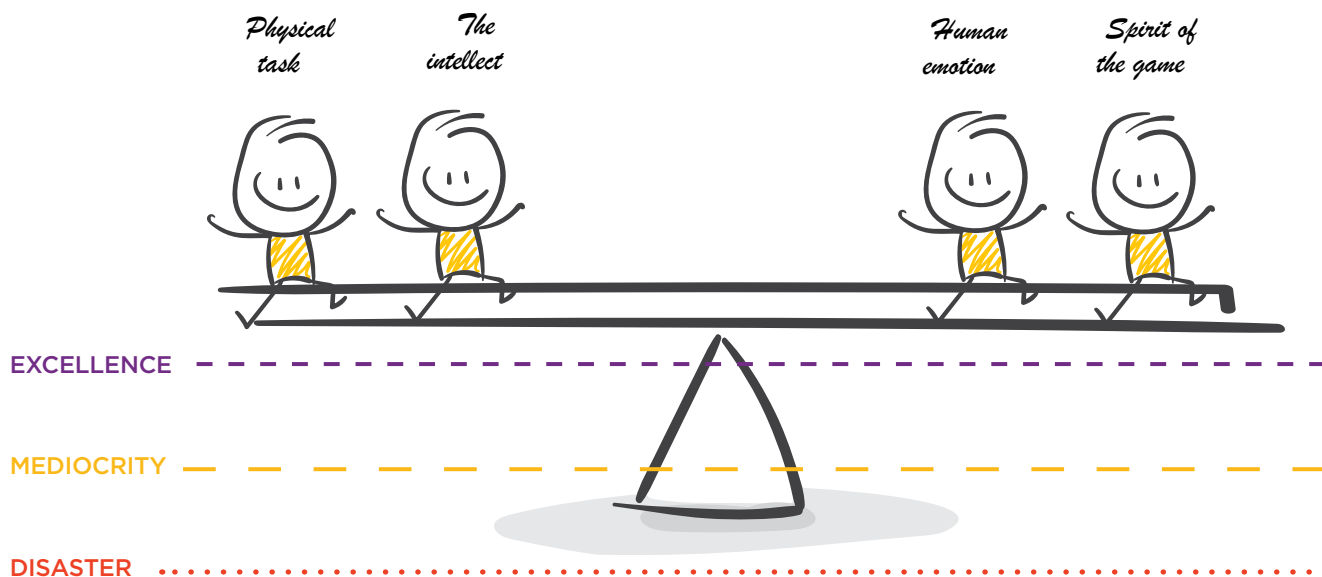
AVOID MEDIOCRITY BY BALANCING A FOCUS ON TASK AND INTELLECT WITH EMOTIONAL ENRICHMENT AND A SPIRIT OF ENDEAVOUR.

THE DIAGRAMS BELOW

ILLUSTRATE four major principles of balancing our life. When task and intellect balance with emotional enrichment and the spirit of endeavour, the seesaw of life maintains a satisfying equilibrium and keeps people in shape. When, in today's demanding and disruptive environment, our attention becomes too heavily weighted towards task and intellect, resulting in little or no focus on spirit or emotions, the

S E I T

SPIRIT OF ENDEAVOUR • EMOTIONAL ENRICHMENT • INTELLECT • TASK AT HAND



imbalance often results in mediocrity.

Australians like to play the ball and not the person. All our lives we learn to play the "task" ball, but pay far too little attention to playing the "spirit of endeavour" and the "emotional enrichment" balls. We too seldom challenge our own dynamics.

Every day, there is growing evidence that more and more of our political and business leaders are losing track of what is important to us as human beings. Many of our society and business leaders concentrate on the physical task and justify, even rationalise, their daily efforts through their intellect. Some attempts by leaders to address emotional enrichment in their teams become a task run by the rational brain (plastic leadership) devoid of spiritual or emotional stimulation. Where are the leaders who know how to address or even recognise the need for us to be emotionally enriched and satisfied and encourage our spirit of endeavour?

Our social environment is corrupting our spiritual awareness and belief

in our humanness. Even adverts on TV these days seem to offer some sort of a spiritual adventure if you but buy a particular brand of toilet paper. Marketeers and ad agencies demonstrate a complete disdain for the general populations' wisdom. Ads for cars no longer address what a vehicle offers mechanically or in comfort, but lead us to believe we are buying some satisfying experience if we buy the car that drives flat out through a shallow riverbed or some such rot.

Politicians treat us as though we are just machines, converting food to energy and waste products and coaxed into being somewhat brain dead so that we truly become sheep. There is too little wisdom, leadership or practical balanced look at life. That is evidenced by the plethora of reality TV shows that focus on the worst of human behavior.

All Aussies are equal except for those who are not.

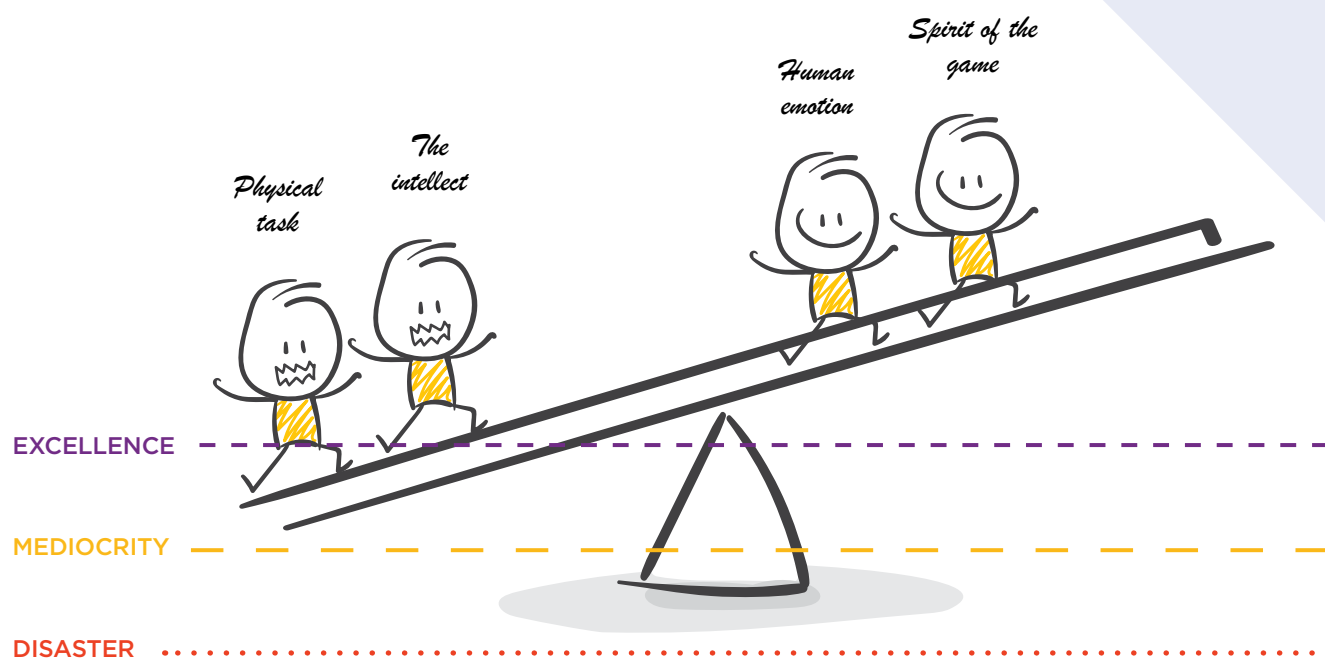
I believe on occasions I have a vision and a sense of excitement and fulfilment. I am full of spirit when I am living something bigger than I am

because it motivates and stimulates life's enthusiasm. And that, I believe, adds an even balance to my world.

Intriguingly, what we really want from life is an alone thing because it hatches inside us and is a sensation rather than physical or characteristic and is only completely understood by us alone. Some of our most magnificent moments will only be magnificent to us and some of our most magnificent moments will be achieved alone. But ironically, no matter how much of our life is an alone thing, we need people to make it happen.

While we will often achieve alone, we need people to help us along the way. We need people to help us acquire wisdom, to share things, to inspire us, to hold our hand, to give us a hug, to have fun, to play the fool and to have a drink, all of which helps balance our lives in a task, intellect, spirit and emotion sense. We need that human enrichment from other people.

I came from a very broke, tumultuous and sometimes violent family. On the other hand, some of the moments of



courage and love in that family were inspirational.

I had my first job when I was 10. I know because *The Yellow Rose of Texas* was a hit in about 1952 and I was working at a garage cleaning the grease from car parts when it first featured on the radio. By the time I was 16, I had three jobs and went to school full time. I did a milk round every morning before school. On Friday and Saturday nights, I worked two milk rounds. During the day, Saturday and Sunday, I worked in a garage and carted hay on a local farm. I virtually did not sleep over the whole weekend. Why? My family needed the money and I needed to feel wanted in a real way.

My sisters and brothers loved me bringing home a sixpence for each on a Saturday night to put in the gas heater so they could all have their own weekly bath. If I could not bring any money home, we shared the same bath, and it was cold and dirty as each person washed off a week's living. I knew nothing about emotional enrichment but for my sisters and brother I had just wrapped some up in a sixpence.

While working in the garage, I learnt something precious from Neville, the

life. Neville has just expressed himself and stuck up, not necessarily for me, but for fairness in life and, no matter how gruff or tough he was in the future, I had seen another side of him: his expectation for everyone's right to some sort of dignity.

Love is too seldom spoken about. Love to me is not 'I love you' and 'you love me'. Love comes in many packets so don't knock it back and don't fail to recognise it just because it is wrapped in something else.

I could never tell my sisters and brother that I loved them, not in among the turmoil and disruptive chaos of my life, but I could give them sixpence for a bath.

One year I worked for three weeks straight carting hay for 16 hours a day and earned 112 pounds. I road my bike 16 miles at 5 o'clock in the morning to start work and home again at 10 o'clock at night. The average wage at that time was about 12 pounds a week and I was quite certain that no-one in the world had the 112 pounds that I was owed. Could not believe it myself. No-one, but no-one, had 112 pounds and, if they did, they were not known to me.

Farmers always paid in cash, but when I went to get my pay, he gave me

I could step outside the suppression of my upbringing.

I needed to give something to my mother to say don't worry. I did not know about hugs; in fact, I knew little about giving or getting love. But as corny as it sounds, I could give her 110 pounds of emotional enrichment or love. Call it what you want. I prefer love. Look at what people are giving even if it is disguised and even if you do not need it. It teaches you about people.

I have met many lunatics, many good people, many larrikins, many con artists and many grubs, and they were all giving me something. I found later that I had learnt how to be a lunatic from a lunatic. The grubs showed me all the best ways to be an ass. My wife taught me, tortuously for her, how to be comfortable with love. Now I was learning choice. I learnt a lot when I learnt that everyone had something to share. And with some practice on my part, people started to share their best with me. I learnt to swear, smoke, drink and be a total ass. But I learnt to share, love, laugh and be a friend.

People did not always know they shared their best, but they did.

We spend our life too bogged down in our minds. My mind is full of crap put there over my life. In life, particularly in communication with each other, we ponder too much what to say or how to act instead of just responding honestly even if on occasions people get precious about what you say. Is the problem then that we do not know each other well enough?

What is important to people? Listen genuinely and you will find out. Why would you bother? Because the stronger the relationship, the more honest can be the conversation.

We come into this world alone and we go out alone, but we do not have to emotionally live that way. Share some love. Not, the platitude, I love you, but show proudly what you stand for in life.

We can physically die, but perhaps spiritual and emotional death is worse. ▀

*Peter Ring,
Principal, Lingk*

... I learnt to share, love, laugh and be a friend.

owner, a very big and rough Australian champion wood cutter. He was never loving, and he was never hugging the trees, he was just chopping them with zeal and precision. But one day when I was pouring petrol into the big limo of a toffee nose customer, I spilt a few drops on the duco and the driver went off his brain. While I was copping it and feeling that this was the way life is, Neville stormed up and said to the toff that if he ever spoke to me rudely again Neville would punch his lights out. Well, my heart swelled and I felt my whole being change, my head went up a little higher, permanently. Someone just stuck up for me for the first time in my

a cheque. I knew about cheques: they often bounced, according to adults. That instantly confirmed my suspicion that he did not have 112 pounds. I rode 15 miles flat out to the bank to get my money, nervously put my cheque over the counter and they coolly gave me 112 pounds.

I rode home flat out, again, and gave 100 pounds to my mother who almost fell over as she had never seen that much money. I then rode flat out to the corner store and bought a double header ice-cream, a rare treat. I then had an attack of the guilts and rode flat out home and gave mum another 10 pounds.

I was nearly broke again but I learnt



TAILORED HOME COVER


GOVERNMENT-OWNED DEFENCE SERVICE HOMES INSURANCE OFFERS HOME INSURANCE TO SUIT THE UNIQUE NEEDS OF AUSTRALIAN DEFENCE FORCE MEMBERS.

FOR MORE THAN 100 YEARS Defence Service Homes (DSH) Insurance has provided comprehensive home insurance to eligible serving and ex-serving Australian Defence Force (ADF) members with attractive premiums and a range of benefits such as no excess for insured events, accidental damage cover and fusion of motor cover at no additional charge.

Now more than 300,000 additional serving and ex-serving ADF members, including Reservists and Peacekeepers, regardless of their length of service, can access all-inclusive home building insurance through DSH Insurance. The eligibility expansion has broadened the access for serving and ex-serving ADF members residing in regional Australia, particularly those currently posted or living in areas that have a high risk of cyclones, bushfires and other natural disasters.

Having no excess on claims helps policyholders get their homes back to a pre-damage condition without having to worry about paying an excess, easing the pressure on household budgets at difficult times. DSH Insurance's Australian-based service team operates nationally and provides uncomplicated insurance and claim services to help ensure policyholders receive the settlement they are entitled to.

DSH Insurance is government owned and administered by the Department of Veterans' Affairs, with revenue generated from premiums invested back into DSH Insurance, helping it provide high-quality insurance products and services at a competitive price. Nine out of 10 policyholders renew their insurance each year.

Find out more by visiting dsh.gov.au/insurance or speak to customer service on 1300 552 662. 

Key features:

- flood and accidental damage
- storm damage
- fusion of electric motors that are part of your home, regardless of age of the motor
- a tailored claims process supported by a broad network of loss adjusters and contractors
- temporary accommodation should your home become unfit to live in
- no excess (other than for earthquake damage and some accidental damage)
- flexible payment options at no extra cost.



A large, stylized yellow piggy bank is the central focus of the top half of the page. It has a simple, friendly face with a small smile. Surrounding the piggy bank are several yellow coins, each marked with a dollar sign (\$), and small white stars. The background is a light gray with a large, curved, yellow and orange striped shape that resembles a rainbow or a stylized horizon line. The title 'CHOOSING A FINANCIAL ADVISER' is written in a bold, orange, sans-serif font, with the words 'CHOOSING A' on one line and 'FINANCIAL ADVISER' on the line below. The text is centered and partially overlaid by the rainbow shape and the piggy bank's body.

CHOOSING A FINANCIAL ADVISER

IF YOU ARE SEEKING FINANCIAL ADVICE, HERE
ARE SOME USEFUL TIPS TO CONSIDER.

DEVELOPING A **FINANCIAL** plan to build and improve your future can be rewarding. Many people welcome the opportunity to undertake that task themselves. Others prefer to engage a licensed financial adviser to guide them through the decision-making process.

If you're inclined to seek the services of an adviser, here are some tips to avoid spending your hard-earned money on unnecessary or poor advice.

The key point is to understand how financial advisers earn a living. Many advisers earn product sales incentives, especially in the form of commissions, bonuses and profit shares (sometimes called conflicted remuneration).

Such incentives cause conflicts of interest which may improperly influence advisers to promote and sell you financial products, whether or not you need them. That has been shown

to be a long-standing and widespread problem, and not just the behaviour of a few bad apples.

Governments have made many unsuccessful attempts to reform the financial advice industry in order to remove conflicts of interest.

The latest effort is a compulsory Code of Ethics and time will tell whether it improves the industry's behaviour. In the meantime, you should be aware that when you consult a financial adviser, incentives and conflicts of interest are likely to influence their advice.

The main form of so-called commission used in the industry – often called an asset fee – is a percentage paid by clients on their investments. Some advisers misleadingly call it a fee for service, which leads many people to believe it's not a commission at all.

The following are some common examples, sourced from real life,

demonstrating how asset fees can lead to poor outcomes for consumers due to conflicts of interest.

THE INHERITANCE

A client inherits \$100,000 and consults a financial adviser who charges asset fees. The client wants advice on whether to pay off a mortgage or start an investment portfolio. The adviser may recommend investing the inheritance in a product from which an asset fee can be earned, rather than encouraging the client to reduce their debt, on which nothing can be earned.

INDUSTRY SUPER FUNDS

A client thinking of using an industry superannuation fund asks a financial adviser for a recommendation. The adviser cannot easily charge asset fees on an industry super fund, so may be inclined to recommend another fund on which they can earn fees.

GOVERNMENT SUPER FUNDS

A military retiree thinking about how much of a government-guaranteed defined benefit pension entitlement should be taken as a lump sum seeks advice from a financial adviser who uses asset fees. The adviser cannot charge asset fees on a government-guaranteed defined benefit pension, but can charge them on certain private-sector products. As a result, the adviser recommends that the client take the maximum lump sum and invest in those products.

TERM DEPOSITS

A client has \$250,000 in term deposits with a bank, maturing next month. The client asks an adviser for a recommendation on where to invest. The adviser can't charge asset fees on the rollover of term deposits, so recommends an investment product on which an asset fee can be charged.

CASH IN THE BANK

A client has \$250,000 in a retail share fund through a financial adviser who uses asset fees. The adviser may understand that it would be in the client's best interests to move some of the money into cash in a bank account (noting the \$250,000 government guarantee), but is not inclined to offer

that advice because the asset fee cannot be continued if the money is moved into cash.

INVESTMENT PROPERTY

A client has \$500,000 in savings and seeks advice about investing it in real estate. The financial adviser is inclined to persuade the client to move the money into a range of investment products on which an asset fee can be charged because moving it into direct real estate will not allow that fee to be charged.

The list goes on. On each occasion, the financial adviser who uses asset fees has a conflict of interest because unless an asset fee is charged, the adviser earns nothing. Other types of incentives that may lead to poor outcomes for clients include bonuses, profit shares and commissions on life insurance, mortgage broking and direct property sales.

The main point to understand is that incentives are designed to encourage product sales, which should cause a client to ask in whose interest the advice is being offered?

There is a growing number of financial advisers who have no remuneration-based conflict of interest. They only charge genuine fees for service calculated on an hourly rate or a flat fee. There are no percentages or product

incentives. By engaging such an adviser, clients have the best chance of receiving advice that provides value for money, can be trusted to be free of conflicts and is in their best interest.

Unfortunately, the bulk of the financial advice industry is not structured so that the average Australian can obtain reasonably priced advice that suits their relatively simple needs and limited means. Therefore, it is important to be realistic, skeptical and to take your time. Make a point of understanding the costs and conflicts involved in the services offered, and understand the costs in dollars, not just in percentages which can sound misleadingly low.

Finally, remember that just because an adviser has no remuneration conflicts of interest doesn't necessarily mean the adviser will be comprehensively knowledgeable about your employment conditions and entitlements. Those are things the adviser can readily research, sometimes with your assistance.

Freedom from remuneration-based conflicts does mean that the financial advice is much more likely to be given in your best interests which must surely be the most important feature of any trusted professional relationship. **W**

*AIRCDR Robert M C Brown AM FCA
Chair ADF Financial Services
Consumer Centre, phone 0431 490 064*



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AIR FORCE ASSOCIATION

WORDS Flying Officer (AAFC) Paul A Rosenzweig



POST-COVID PREPARATION



ABOVE One of the AAFC's DG1000S gliders with Warwick Gliding Club's Piper Aircraft Corporation PA-25-235 tug. Photo by LAC(AAFC) Tristan Solway.

LATE IN 2020, Aviation Operations Wing began conducting a graduated return to flying to prepare for and conduct safe and effective Australian Air Force Cadets (AAFC) aviation operations.

WARWICK GLIDER TRAINING FLIGHT

"On the weekend of 31 October – 1 November 2020, Warwick Glider Training Flight returned to flying operations, but at this stage it is only for staff recertification and training purposes, following the long break due to COVID-19," reported Pilot Officer (AAFC) Brie Russell, Flight Commander of Warwick Glider Training Flight.

Activities were aimed at ensuring staff pilots had the skills, knowledge, currency and experience required to conduct safe and effective AAFC aviation operations once approval was received to recommence instructional and experience flights with Cadets. It also allowed staff to address the COVID-19 safety aspects of a return to flying operations.

Warwick Glider Training Flight, formerly No.902 Aviation Training

Squadron, is based at Archerfield Airport in Brisbane. The flight is a component of the newly established Gliding Training School, a subordinate unit of the AAFC's Aviation Operations Wing.

Gliding Training School conducts Pilot Experience flights to give Cadets the feel of flying a DG1000S sailplane and progresses selected Cadets through formal training courses with the intention of achieving solo sailplane pilot status. With appropriate training and experience, Cadets as young as 15 years (the minimum legal age) can fly their first solo flight.

"During the non-flying period, the flight instructional staff met via Zoom on a fortnightly basis to continue development of our flying program and maintain our safety focus," said PLTOFF(AAFC) Russell, who is a former Air Force Cadet. "We are looking forward to resuming the development of aviation skills in our Cadets and seeing them grow into skilled pilots."

BALAKLAVA REFRESHER COURSE

On the weekend of 13-14 March 2021, Balaklava Glider Training Flight

conducted an Aviation Theory Refresher Course at RAAF Edinburgh for cadets who had previously undertaken a formal Aviation Theory Training package with Balaklava Flight or its predecessor, No.906 Aviation Training Squadron.

The refresher course comprised a review of the aviation theory components of Basic Aeronautical Knowledge, in accordance with the theory standard requirements of the Gliding Federation of Australia and the Civil Aviation Safety Authority.

Flying Officer (AAFC) Ian Wright, Flight Commander of Balaklava Glider Training Flight said: "Our staff provided revision for the trainees and brought them up to date on aviation matters generally. Using our collective experiences, we also took the opportunity to discuss careers in the aviation and aerospace industries".

FLGOFF(AAFC) Wright served as a member of the Permanent Air Force from 1981 to 1998 and among his awards, he received the Australian Service Medal with clasp "SE ASIA" and the Defence Force Service Medal.

Two of the refresher course participants had been selected to attend a powered flying course in late 2019 by the Elementary Flying Training School at Point Cook but were unable to go solo at that time. Another participant had been a gliding trainee but had not gone solo before the operational pause was imposed last year. The course panel also included three staff who had previously completed an Aviation Theory Training course and planned to participate in future Balaklava Flight activities.

"Our instructional staff have maintained regular contact and kept our safety procedures up to date, and we have kept the gliders in an airworthy state in readiness for resuming our flying program," said FLGOFF(AAFC) Wright. "We've been fortunate to do some staff flying for recertification and to maintain currency, and we are now looking forward to giving Cadets the opportunity to fly."



ABOVE Flying trainees from No.6 Wing who attended an aviation theory refresher course in March 2021. Photo by FLGOFF(AAFC) Paul Rosenzweig.

RAAF MUSEUM POINT COOK

The RAAF Museum, located at Point Cook, is home to an amazing range of historic military aircraft.

The Museum has a vast collection of historical material on show, including several hangars with static aircraft. It offers visitors an exciting experience and insight into the history of the Royal Australian Air Force.

Models, books, patches, clothing and mementos can be purchased at the Museum shop.

OPENING HOURS:
Due to COVID-19,
please check our
website and Facebook
page for reopening and
booked attendance
requirements.



**ENTRY TO THE RAAF
MUSEUM IS FREE**



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THE AUSTRALIAN AIR LEAGUE is for boys and girls aged eight years and older who have an interest in aviation either as a career or as a hobby. In the Air League they learn about aviation in all its forms through classes in theory of flight, navigation, aircraft engines and a variety of interesting subjects.

For further information, see airleague.com.au, phone 1800 502 175 or email info@airleague.com.au.



LEFT Second Officer Darby Thompson pre-flights Piper Warrior VH-LRA under the supervision of instructor Jonathan Nolan.

FLYING CAMP 2021

EACH YEAR IN THE JANUARY SCHOOL HOLIDAYS, the NSW Group of the Australian Air League (AAL) conducts a Flying Camp at its Air Activities Centre at Camden Airport south west of Sydney. The camps provides an opportunity for cadets to undertake nine days of intensive flying training.

Established at Camden in 1986, the Air Activities Centre allows the Air League to provide air experience flights and flying training to its members and the annual Flying Camp has been a highlight of our calendar. During the camp, the cadets live, study and work together as a team while undertaking flying training with the Air League's volunteer instructors. The cadets arrive with a wide variety of experience. For some it will be their first camp where they have their first taste of flight. For others it will be an opportunity to build on their training from previous camps.

In 2020, the bushfires that ravaged NSW made flying all but impossible and cut the camp short, and then COVID restrictions prevented all further face-to-face contact for most of the year. With the easing of restrictions in 2021, the

camp was rescheduled for April and saw 14 student pilots from nine NSW Squadrons travel to Camden.

With the reduced attendance due to social distancing requirements, fewer flight hours were logged than previous years, however the cadets still managed to complete 60.2 hours of flying over 60 flights and 150 landings. The highlight of the camp for 16-year-old Sgt Thomas Gould of Sutherland Shire Squadron was his first solo in Piper Warrior VH-LRA.

This year also saw the arrival of a new addition to the Air Activities Centre's fleet, a Cessna 172M VH-PAT which will

provide further opportunities for flight training and air experience flights for many years to come.

All of that would not have been possible without the assistance of the instructors, engineers and camp staff who volunteer their time to maintain the aircraft and train and supervise the cadets for the week. We thank them for their dedication to the aims of the Air League.

The Air League's Air Activities Centre at Camden is owned and operated by the NSW Group of the Australian Air League, with a fleet of training aircraft including a Piper PA-28 Warrior, Cessna 172 and Cessna 152. For more than 30 years, it has provided thousands of air experience flights and training hours to members of the League, helping to achieve the League's motto to be *a vinculo terrae* – free from the bonds of the Earth.



Cadets and instructors gathered for a group photo at the end of the camp.



SQUADRON LEADER PETER THEODORE JENSEN

12 April 1921 - 8 April 2021

PETER JENSEN WAS the son of a Danish seaman who arrived in Sydney, joined the Australian Imperial Force in 1915 and served in World War I. Born on 12 April 1921, just two weeks after the formation of the Australian Air Force, Peter passed away on 8 April 2021, four days short of reaching his own century.

Growing up in Gladesville, NSW during the depression was made more difficult as Peter's father had lost an arm during the war.

Peter enlisted in the RAAF on 3 February 1941 and, after initial training at Bradfield Park, Sydney, was selected to join the Empire Air Training Scheme to train as a Wireless Operator/Air Gunner. He was sent to No.3 Wireless School at Winnipeg, Canada.

Commissioned on graduation, he travelled on *Wolfe*, an armed merchant cruiser, to the United Kingdom for further training at No.1 Radio School, RAF Base Cranwell.

Radar training at No.3 Signals School at Prestwick near Ayr in Scotland followed, then No.11 Signals School, Hooten Park, in preparation for employment in Coastal Command, and finally, No.4 Coastal Command Training Unit at Invergordon where, on 15 July 1942, he joined No.461 Squadron flying Sunderland aircraft and teamed

up with the crew he would fly with on operations.

Stationed at Mountbatten near Plymouth, No.461 Squadron flew anti-submarine patrols over the Bay of Biscay or convoy escorts over the Atlantic and, occasionally, air-sea rescue searches.

During a Gunnery Leader's Course at Sutton Bridge, Norfolk, in March 1943, Peter was badly injured when the Wellington aircraft in which he was a crew member crashed. After hospitalisation and several months rehabilitation, he returned to No.461 Squadron, now stationed at Pembroke, Wales, flying anti-submarine patrols over the Bay of Biscay.

On 30 July 1943, when crewed in Sunderland U/461, his aircraft came upon three U-boats on the surface with three Allied aircraft circling overhead. U/461 made an attack at 60 feet, just clearing the conning tower, under very heavy anti-aircraft fire and sank one of the German U-boats, coincidentally also designated U-461. After the war, Peter met the Captain of U-461 and became firm friends.

After a 45-minute running battle with six long-range Junkers-88 interceptor aircraft on 16 September 1943, Peter's Sunderland was forced to ditch in the Bay of Biscay. Eleven crew members survived 17 hours in a six-man dinghy, the only one without shrapnel damage.

Peter returned home at the rank of Squadron Leader on 26 March 1945 and was discharged on 11 September.


After the war, he was instrumental in establishing the Sunderland Association as branches of the RAAF Association in each state. He served as President of



BELOW Peter, October 2020 with his Australia Remembers certificate and medal.



the NSW Sunderland Branch for 14 years and as the Secretary before then. He had been a significant driving force within the branch since its inception.

Peter Jensen was awarded the *Legion d'Honneur* in 2017; an unsung hero, finally recognised. 



ABOVE Peter on his 21st birthday in Brighton, UK, in 1942.



BELOW From left, Dudley Marrows, pilot of U/461, Wolf Stiebler (Korvettenkapitan) of German U-boat U-461, and Peter Jensen, WOP/AG of U/461 at the War memorial, Canberra, 1988.

Peter at home, pouring Wolf a drink on his visit to Australia in 1988.





REVIEW BY Bob Treloar

IN THAT RICH EARTH

By **BRAD MANERA WITH CRAIG WILCOX AND CHRIS CLARK**

The Trustees of the Anzac Memorial Building, RRP \$39.55

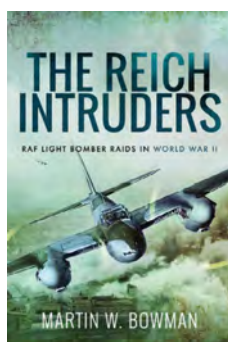
IN THE FLOOR of the Hall of Service at the Anzac Memorial are displayed samples of soil collected from 100 battlefields around the world which Australians have walked over, driven over, sailed past, flown over or dug in.

In That Rich Earth provides a background to each of the battles from which the soil has been gathered. Each is described in overview, with a map and remarkable photographs which bring the conflict to life. There are five major sections: Colonial Wars; The Great War; World War II; Australia in Asian wars; and Peacekeeping and recent conflicts.

Understandably, given the nature of our history, the focus of the book is on land battles, however, the authors have taken great care to ensure that air and naval forces are appropriately recognised for their own battles and for their effect on the outcome of the land battles in which they were involved.

The authors are eminently qualified. Brad Manera is the senior historian/curator of the Anzac Memorial and has held a similar position at the Australian War Memorial. Craig Wilcox, former historian at the Australian War Memorial, is a fellow at the Menzies Centre for Australian Studies in London. Chris Clark graduated from the Royal Military College, Duntroon in 1972, and gained his PhD from the Australian Defence Force Academy. He is the RAAF historian.

In That Rich Earth is beautifully presented with a wonderful collection of photographs, maps and posters. It will appeal to any reader interested in Australia's military history, regardless of their service or state of origin.



REVIEW BY Bob Treloar

THE REICH INTRUDERS: RAF Light Bomber Raids in World War II

By **MARTIN M. BOWMAN**

Pen and Sword Aviation, RRP \$34.99

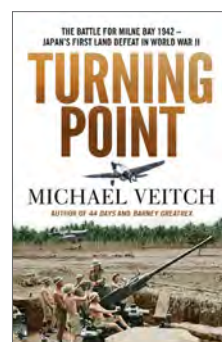
THIS IS THE STORY of No.2 Group, Royal Air Force (RAF), which flew Blenheim, Boston, Mitchell and Mosquito bombers on raids over Nazi-occupied Europe during World War II.

While the RAF and the United States 8th Air Force conducted a strategic bombing campaign against Germany using heavy bomber aircraft, the RAF employed its light bomber force against shipping along the European coastline from France to Norway and against tactical targets in the occupied countries.

The objective of the strategic bombing campaign against Germany was to cripple the enemy's capability to wage war. While the campaign waged by the light bombers was to hinder the movement of troops and matériel along the European coast. It was a relentless, intense and costly campaign which began with the Battle for France in 1940 and continued unabated until VE (Victory in Europe) Day.

Martin Bowman is one of Britain's leading aviation authors. *The Reich Intruders* is exceptionally well researched and is easy to read. With the large amount of detailed information concerning identification of aircrews, their deeds and fate, *The Reich Intruders* could have been presented as a textbook on the conduct of operations. Bowman's skills, however, have ensured that it is an absorbing and informative account of the campaign and the airmen, many of whom had little prospect of completing their assigned tour of duty.

Well suited to the student of air power, it is also recommended for readers who want to learn of the operational feats of everyday men recruited into the Air Force for the war. It is an excellent read.



REVIEW BY Bob Treloar

TURNING POINT: Battle for Milne Bay 1942 – Japan's first land defeat in World War II

By **MICHAEL VEITCH**

Hachette Australia, RRP \$32.99

IN TURNING POINT, Michael Veitch has produced a superb historical account of Australia's first victory against a determined and well-trained enemy seeking control of a vital airstrip on the eastern end of Papua New Guinea. From there they would control the northern approaches to Australia, springboard to capture Port Moresby and neutralise the Australian war effort.

It is an easy-to-read account of the severe trials of the Australian troops and US Army Engineers who carved out an airstrip, topped with perforated steel planking, in a malarial infested quagmire – and in utmost secrecy, completely missed by the Japanese.

It is also the story of the soldiers of the AIF, the Militia, and the air and ground crews of the RAAF who put aside their single-service attitudes and melded into the one effective fighting force, prepared to put their lives on the line to protect each other.

Veitch blends the history of the battle with the personal insights of those who flew combat missions, prepared the airstrips and supporting infrastructure, and fought the Japanese in desperate and bitter combat at close quarters. While the outcome of the battle is known, the author generates a sense of excitement and readily engages the reader.

The Battle for Milne Bay was Australia's first victory against the Japanese; indeed, it was the first land defeat suffered by the advancing Japanese forces, and yet several revered works on Australia's wars have neglected to reference this battle. *Turning Point* helps to address those omissions.

Every aspect of Astra Aerolab is designed to uplift performance. With outstanding integration of technology and lifestyle in an idyllic region, co-located with RAAF Base Williamtown and Newcastle Airport, this is a unique opportunity to join the world's leading defence, aerospace and innovation precinct.

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Newcastle Airport congratulates the Royal Australian Air Force for 100 years of service to Australia. We wish the air force personnel all the best for the future.



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We salute the **Royal Australian Air Force** on its **100th anniversary**

We are immensely proud to have powered the Royal Australian Air Force throughout its illustrious 100 year history. Our long relationship remains strong to this day, and we will continue to support the air men and women into the future. We have shared a century of innovation, partnering to break new ground in the field of aviation, and we are committed to continuing that pioneering spirit to enable future generations to reach for the skies.