WINGS

AUTUMN 2021
VOLUME 73 NO.1

CELEBRATING AN AIR FORCE MILESTONE

LOOKING BACK
THE RAAF'S EARLY YEARS

AVALON
THE SHOW GOES ON

100

Centenary

AIR FORCE ASSOCIATION MAGAZINE

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ON THE COVER

The cover pays tribute to the Air Force Centenary and invokes a faded memory of rugged beginnings, while paying homage to the men and women who provide the bedrock of a potent fighting force.

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MESSAGE FROM RAAF BASE AMBERLEY

AS THE SENIOR AUSTRALIAN DEFENCE FORCE (ADF) OFFICER for RAAF Base Amberley, I am delighted to introduce both this autumn edition of *Wings* magazine and provide an insight into one the largest Air Force bases in the country.

RAAF Base Amberley is one of our largest operational air bases, where we deliver airpower and joint capabilities to defend our nation and its interests. On any given day, the base is home to a range of air mobility, air combat and airbase support capabilities, to name a few, that together can rapidly deploy in support of single service, joint or coalition operations.

It is my honour and privilege to represent our Defence people and their families in the wider South East Queensland community and to concurrently ensure our base is ready to support the range of operational, training and industry capabilities that call RAAF Base Amberley home.

We acknowledge the Yuggera and the Ugarapul people – the Traditional Custodians of the land – and pay our respects to their Elders, past, present and emerging.

We share a commitment for protecting country and community and looking after our people. We also have a strong and collaborative relationship with our local Elders and I encourage you all to take the time to better understand our Indigenous history, culture and customs.

RAAF Base Amberley was officially opened in June 1940 and will celebrate 81 years' service as an operational air base in 2021.

On 31 March 2021, the Air Force will celebrate its 100th year of service as an independent air force. Throughout 2021, we will acknowledge our centenary and, together with industry, government, council and – most importantly – our people, celebrate our history, our achievements and our future.

We will continue to meet day-to-day operational requirements, deliver flexible capability for our nation, develop future base plans and introduce technology that will keep us at the forefront of airpower generation.

I trust you enjoy this edition of *Wings* as we celebrate our 100th year as an air force.

Group Captain Iain Carty, CSM
Senior Australian Defence Force Officer
RAAF Base Amberley

LIBERATOR RESTORATION

I read with great interest the article in the Summer 2020 edition about restoring a B-24 Bomber at Werribee.

I was the ADMINO at 21 Squadron (City of Melbourne) for many years and was associated with the project, as was the Squadron Engineering Section. Gary Jarvis was the 21SQN officer to visit PNG and make arrangements for removal and transport of the wing section mentioned in the article.

The project was beset with problems – break-ins and theft of tools and equipment, plus indecision as to the future of the hangar. I knew Bob Butler, as he was one of my instructors when I was an Air Training Corps Cadet (8217) back in the late 1940s, and later on his many visits to 21 SQN as part of the project.

David Crickmore, Scarness, Qld

B-24 VISIT

I read with interest your article and photos, regarding the B-24 Liberator Bomber. I recall visiting the project many years ago. I was not allowed to enter the part-constructed fuselage.

I am a WWII veteran and, having opened my log book for the first time in 75 years, I noted I had completed 19 sorties, approximately 240 operational hours, with trips varying from 12 to 15 hours over Burma, French Indo China and Siam as they were named. We were sworn to secrecy about our operations.

Our crew was two pilots, two WAGs, a navigator, a bomb aimer and a tail gunner. I was a WAG.

Merv McGrane, Bundaberg, Qld

AUSTRALIA'S FIRST AIRLINE

I was pleased to read in Don Hill's feature on the early years of Qantas, that he mentioned Norman Brearley operated Australia's first commercial airline, West Australian Airways.

Brearley's story is very interesting. I had a copy of his autobiography many years ago which I loaned to someone and consequently lost. His book is called *Australian Aviator* and is well worth reading.

Graham Thomas, via email

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

MANAGER'S MESSAGE

RAAFA Publications Pty Ltd, a resource fully owned by Air Force Association NSW, has been producing *Wings* in the modernised form for two years with this edition and, by all accounts, it has been well received.

In this edition, we acknowledge the Air Force centenary and the contribution air power has made to our young nation, both commercially and militarily. We begin an Air Force history series and continue the Qantas and Skunk Works series. We also introduce a short series on an Aussie larrikin determined to break his own land speed record and with aspirations to break the sound barrier while in contact with terra firma.

We hope you continue to enjoy the magazine and encourage all with an interest in air power, a little history, technology and a good yarn to subscribe for a mail-delivered personal copy.
I would also commend a subscription to the magazine, as a gift, to budding young (and the not so young) aviators, space travellers and technicians with an interest in all things that work in the environment between us and our neighbouring planets and that evolve to advance our knowledge and improve our lives.

Visit our website, wingsmagazine.org, to read previous issues and arrange a personal or gift subscription.

Ron Haack
Wings magazine manager

EDITED BY Bob Treloar

F-35As ready FOR DEPLOYMENT

AUSTRALIAN MINISTER FOR Defence declared Initial Operational Capability for Australia's F-35A Lightning II aircraft on 28 December 2020. The RAAF Lightnings can now be deployed operationally, joining the other services around the world that have achieved the capability: US Air Force, Navy and Marine Corps, Italian Air Force, Israeli Air Force, Republic of Korea Air Force, Royal Air Force, Royal Norwegian Air Force and Japan Self-Defence Air Force. RAAF plans to achieve Final Operational Capability by 2024.

The service will procure 72 aircraft to replace the F/A-18A/B Hornet aircraft and complement the F/A-18F Super Hornet and EA-18G Growler Electronic Attack aircraft. The fifth-generation aircraft will equip three operational squadrons; two at RAAF Base Williamtown, NSW, and one at RAAF Base Tindal, NT.

The Operational Conversion Unit has already transitioned to Lightning II.

Australia's first two locally based F-35As arrived at RAAF Base Williamtown on 18 December 2018 and the base currently operates 33 F-35As with a contingent of 45 pilots and 600 maintenance crew. To date, the RAAF has flown more than 8,780 flight hours.

Source: The Aviationist

ABOVE Head-on view of an F-35A Lightning II flying off Newcastle, NSW. Photo: RAAF.

Wedgetail back home

AIR FORCE E-7A WEDGETAIL AIRCRAFT and support personnel have returned to Australia following a successful year-long deployment to the Middle East Region (MER). The occasion also marked the 10th anniversary of the introduction of the E-7A Wedgetail into RAAF service.

The aircraft has been operating in the MER with Australia's Air Task Group 630, performing airborne command and control as part of Operation Okra, the Australian Defence Force's contribution to the United States-led global Coalition to combat the Daesh terrorist threat in Iraq.

During operations, the RAAF E-7A Wedgetail was responsible for the command and control of all coalition aircraft in a battle management area, and crews regularly managed more than 80 combat aircraft at once. More than 550 missions were flown since September 2014 accumulating over 6,900 flying hours. One mission involved a flight duration of 17.3 hours – the longest flight recorded for a Boeing 737 airframe.

Source: Defence Connect

BELOW E-7A Wedgetail on the Tarmac in the Middle East. Photo: CPL Dan Pinhorn.

RAAF P-8A Poseidon at the Avalon Airshow in February 2019.

Boost for maritime fleet

TWO ADDITIONAL BOEING P-8A POSEIDON aircraft will be added to the RAAF's maritime patrol fleet, increasing the force size to 14 aircraft. Sustainment funding has also been approved for three Northrop Grumman MQ-4C Triton unmanned air vehicles, yet to be delivered. The Poseidon and the Triton will provide Australia with one of the most advanced maritime patrol and response capabilities in the world.

The acquisition is part of the government's plan to invest $270 billion in defence capability in the 2020s.

Source: Flight Global

EXERCISE LIGHTNING SPEAR

THE AUSTRALIAN AND UNITED STATES AIR FORCES participated in Exercise Lightning Spear at Eglin Air Force Base, Florida, USA, last October, developing interoperability between the two services with a common but relatively immature capability – the F-35 Lightning II combat aircraft.

The F-35A's combination of full-spectrum low-observable stealth coatings and materials, advanced radar-dispersing shaping, network-centric sensor and communications suites – combined with a lethal strike capability – means the aircraft will be the ultimate force multiplying, air-combat platform.

Officer Commanding No.81 Wing Group Captain John Haly said the exercise demonstrated the crucial capability of the growing Lightning force in Australia.

The RAAF team then conducted Exercise Lightning Ferry to bring an additional nine Lightning aircraft from Luke Air Force Base, Arizona, to RAAF Base Williamtown via Hickam Air Force Base in Hawaii. They were sustained enroute by RAAF KC-30A multi-role tanker transports.

Source: Strike & Air Combat

RAAF F-35As at Eglin Air Force Base.

SW PACIFIC FISHING PATROL

AS PART OF DEFENCE'S efforts to support the economic prosperity of Australia's neighbours and thus enhance the security and stability of our region, Operation Solania assists the Pacific Island Forum Fisheries Agency in detecting illegal, unreported and unregulated fishing in the south-west Pacific. A RAAF C-27J Spartan aircraft deployed to provide aerial surveillance completed the current ADF commitment in November 2020.

Source: Defence Connect

C-27J crew on station over the south-west Pacific.

Apache to replace
ARMY TIGER

DEFENCE HAS SELECTED the Boeing AH-64E Apache Guardian to replace Army's Armed Reconnaissance Helicopter (ARH) from 2025 under Project Land 4503.

The AH-64E is equipped with improved sensors, communications suites, attack capabilities and enhanced survivability.

Defence considered several helicopters against key criteria of proven ability, maturity and an off-the-shelf operating system and deemed the Apache Guardian the most lethal, survivable and lowest risk option.

In a statement, Defence said: "Lessons learnt from issues with the ARH Tiger and other rotary-wing projects had informed the strategy to seek a proven, mature ARH replacement capability."

The Apache was selected over a Bell/BAE Systems Australia teaming arrangement (offering the Bell AH-1Z Viper) and an Airbus offer of an upgrade to the incumbent Tiger platform.

Source: Australian Defence magazine

ABOVE AH-64 Apache helicopter. Photo: SGT David Hicks.

LEN WATERS BUILDING OPENS

AS PART OF THE redevelopment of RAAF Williamtown, NSW, to accommodate the F-35 Lightning II, the RAAF officially opened the Len Waters Building in October 2020. The building was named after Australia's only known Indigenous World War II fighter pilot.

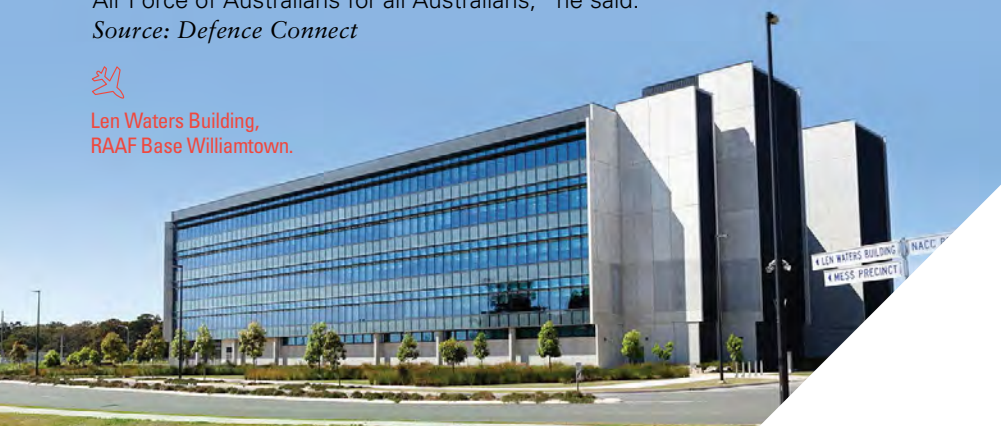
Len Waters enlisted in the Air Force in August 1942 as an aircraft mechanic and earned his wings in July 1944. He learnt to fly in Tiger Moths and Wirraways before joining No.78 Squadron flying Kittyhawks.

During nine months of active service, Waters flew 95 sorties in the Pacific campaign, operating from Noemfoor, Morotai and Tarakan. He was discharged on 18 January 1946, with the rank of Warrant Officer.

He died from pneumonia in August 1993, aged 69, and is survived by his wife and six children.

Air Commander Australia, Air Vice-Marshal Joe Iervasi said it was a great honour to dedicate the building to Len Waters. "It is important to recognise and embrace the stories of all who have served, and continue to serve, so we can truly be the Air Force of Australians for all Australians," he said.

Source: Defence Connect



Len Waters Building, RAAF Base Williamtown.

Singapore Air Force
IN DARWIN

ABOUT 200 REPUBLIC of Singapore Air Force (RSAF) personnel, along with RSAF's F-15SGs, an A330-Multi-Role Tanker Transport (MRTT) and a G550 Airborne Early Warning aircraft, were stationed at RAAF Base Darwin for a two-month detachment between October and December 2020.

Due to airspace constraints in Singapore, the RSAF conducts training overseas to meet national preparedness requirements, and also has detachments in the US and France. The deployment marked Singapore's strong defence ties with Australia and the 30th anniversary of the RSAF's training presence in the Shoalwater Bay Training Area.

Source: Channel News Asia

ABOVE RSAF F-15SG and A330-MRTT in company.

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Second Hercules EQUIPPED WITH SATCOM

A SECOND RAAF C-130J HERCULES has been upgraded with a high-speed satellite communications (SATCOM) system. The first C-130J was equipped with the SATCOM system in 2017 and six aircraft are planned for upgrade.

The RAAF is the first operator of C-130J Hercules to install a Ka-band SATCOM system, which allows high-definition video live-streaming and connectivity to command headquarters and other nodes around the world. C-130J Hercules are often a first response for missions such as disaster relief, deploying to remote locations where communications infrastructure is often damaged or non-existent.

Commander Air Mobility Group Air Commodore Carl Newman said: "Deploying a Hercules might require a flight of up to 10 hours and, in that time, the operating environment for both the crew and embarked joint capabilities could vary significantly. Hercules equipped with high-speed SATCOM allows control elements, crew and embarked forces to conduct mission planning while enroute."

A C-130J Hercules fleet is operated by the No.37 Squadron from RAAF Base Richmond, NSW. The third aircraft is programmed to be fitted with the Ka-band SATCOM capability by April 2021.

Source: Air Force Technology

ABOVE No.37 Squadron C-130J Hercules A97-468 and A97-467 have been fitted with Ka-band satellite communications systems. Photo: Corporal David Said.

Hornets on DISPLAY

A RAAF F/A-18A HORNET (A21-022) aircraft with a decorated three decades of service has been welcomed into the Australian War Memorial's collection.

A21-022 was deployed to Operation Falconer in 2003 and took part in 20 combat missions. During Operation Okra in 2016–17 it flew more than 50 combat missions against ISIL targets in Iraq and Syria. It was retired last May after completing 30 years in service and 6131.5 flying hours.

A second F/A-18 Classic Hornet (A21-040) is scheduled to be handed to the Australian War Memorial in mid-2022.

BELOW A21-022 positioning on the low loader for transport to Canberra. Photo: CPL Brett Sherriff.

Orion guards THE GATE

IN RECOGNITION OF THE ORION'S distinguished RAAF service over more than 50 years, a decommissioned aircraft now takes pride of place at the RAAF Base Edinburgh front gate.

The refurbished Orion A09-658, which began RAAF service in 1985, was towed into position on 1 November 2020.

Former AP-3C Orion navigator and tactical coordinating officer, Director-General Air Force History and Heritage Branch, Air Commodore John Meier said the gate guard honour highlighted the importance of preserving Air Force history for future generations.

"It reinforces the dedication, sacrifice and exemplary service of the many Air Force and civilian personnel who have supported the P-3 Orion aircraft since 1968," he said.

Source: RAAF News

LEFT ADF personnel and civilians in front of the decommissioned AP-3C Orion at the front gate of RAAF Base Edinburgh. Photo: LACW Jacqueline Forrester.

ROULETTES' 50-YEAR MILESTONE

Roulettes crew with the new PC-21 in Roulette Livery.

DEFENCE HAS ACKNOWLEDGED the 50-year anniversary of the first public display of the RAAF's formation aerobatic team, the Roulettes.

The Roulettes initiative was established in November 1970 as part of the celebrations marking the RAAF's golden jubilee and the team undertook its first public display later that year.

The Roulettes flew Macchi MB-326H jet aircraft before moving to the Pilatus PC-9/A turbo-prop in 1989 and the Pilatus PC-21 in 2019.

The impressive skills demonstrated by the Roulette pilots have been witnessed by many at international events and in small country air shows over the years.

Source: Defence Connect

RAAF Base Williamtown celebrates TWO MILESTONES

ON 15 FEBRUARY, a combined celebration was held at Fighter World Williamtown to mark the 80th birthday of the Air Base and Fighter World's 30th.

To open proceedings, Ross Pay arrived from Scone in his restored P-40 Kittyhawk, which took up a static display position at the entry to Fighter World.

A brief history of the base was presented by the recently arrived Senior ADF Officer GPCAPT Anthony Stainton. He noted that, from its beginnings as a base to provide strategic protection for Newcastle Port and the steel industry, it grew to accommodate Australia's increasing fighter capability. It is now home to two of the RAAF's four Groups, four aircraft types including the new fifth-generation F-35A Lightning II, and more than 4,000 personnel.

Fighter World President AVM John Quaife (retd) paid tribute to the initiative and enthusiasm of former base and Tactical Fighter Group Commanders to establish and grow Fighter World, soliciting essential financial support from the Federal Government and local businesses. Today Fighter World welcomes 25,000 visitors a year and will continue to grow as it looks forward to an expansion of its facilities as part of the Air Force History and Heritage organisation.

No.100 Squadron to be re-formed

NO.100 SQUADRON is being re-formed as the Air Force Heritage Squadron.

Announcing the decision, Minister for Defence Personnel Darren Chester said that after a 75-year absence, it was fitting RAAF reactivates 100SQN in the year it commemorates its first 100 years. "The heritage fleet of 100 Squadron will continue to recognise the service of previous generations and inspire the next generation of pilots," he said.

100SQN RAAF was originally formed at RAAF Base Richmond in 1942 from the remnants of 100SQN RAF which had been evacuated just prior to the fall of Singapore. The squadron was equipped with Bristol Beaufort aircraft and saw service in PNG in both torpedo and bombing roles before being disbanded in 1946.

The re-formed squadron, to be commanded by WGCDR Phil Beanland, will be headquartered at RAAF Base Point Cook and will take over two hangars currently used by the RAAF Museum for restoration work. It will manage and operate the aircraft belonging to the heritage fleets at Point Cook and Temora and will be manned by a mix of permanent RAAF and RAAF reservists.

PRESIDENT'S CORNER

THE ASSOCIATION and other Ex-Service Organisations (ESOs) maintained their dialogue with the government and its agencies throughout 2020, despite COVID limitations. Looking for positives, COVID reinforced the importance of regular conversations and working collaboratively towards the delivery of support to veterans and their families.

Last year we saw, among other things, the establishment of the Family Veterans' Advocate, the Office of the National Commissioner for Defence and Veteran Suicide Prevention, and the government's response to 25 of the Productivity Commission's 69 recommendations with others to follow mid-2021. Those recommendations have been the subject of extensive consultation with the veteran community. It wasn't surprising they attracted strong emotional responses, either supporting or criticising the initiatives.

The Productivity Commission's inquiry into veteran support highlighted significant shortcomings. Central to the problems are the three veterans support Acts that complicate the system. Harmonisation of existing legislation has been suggested to simplify the system. However, harmonisation would be expensive and involve a substantial body of work. There is a growing interest within the veteran community towards the creation of a new Act to replace existing legislation, while preserving current benefits. Resources assigned to that activity may be better served than applying 'band-aids' to existing legislation.

Department of Veterans' Affairs (DVA) recently surveyed the effectiveness of the National Consultative Framework (NCF) that comprises several forums designed to provide strategic advice on veterans' issues, as well as information on matters affecting day-to-day administration of veteran support. The survey was very critical of the NCF. Consequently, DVA established an NCF working group to investigate a revised structure. I was asked to chair the working group which includes Sharon Bown (Vice-President, Air Force Association) and representatives of several other ESOs.

Working correctly, the NCF will have a significant impact on government decisions and the administration of veteran support. Most major national ESOs are represented on the forums, but there is little contemporary veteran representation.

Veterans, regardless of generation, have the same fundamental needs. Some needs were not identified in earlier generations. Understandably, each veteran generation has a raft of different experiences that emphasise issues. Each generation has worked to protect veterans' benefits and identify ways to improve veteran support. It has been and will always be an ongoing campaign.

Traditional ESOs have been criticised as out of touch with contemporary veterans. There may be an element of truth in that critique; young veterans' needs diverge from those of past generations. Young veterans are talented and educated and need to become formally involved to help the older veterans in established ESOs resolve their issues.

There is serious concern for the quantity of Compensation Advocates. DVA is hosting a working group to consider improvements to the delivery of advocate training to make it more accessible. Advocacy is an area where younger veterans can make a considerable contribution as well as obtaining formal qualifications in the art of advocacy.

I hope 2021 will be a year in which we can all make a difference.

Carl Schiller, OAM, CSM
National President
Air Force Association

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AIR FORCE 2021 Centenary

AIR FORCE CENTENARY SA LAUNCH

THE ANNUAL ROYAL AERONAUTICAL SOCIETY (Adelaide Branch) Sir Ross and Sir Keith Smith Dinner was held on 6 åDecember 2020. The theme was 'Honouring the Air Force Centenary in 2021' and the dinner launched the centenary in South Australia. Guests of honour were SA Governor Hieu Van Le and Premier Steven Marshall.

Passionate air-minded people from across the Defence, aviation, heritage, veterans and broader community came together to enjoy a great Air Force display, including RAAF Edinburgh's new indigenous air weapons display acknowledging our First Nations people's employment of weapons in the air. The evening also saw the launch of the 10-piece Air Force Centenary in South Australia exhibition banner set which provides fascinating storytelling of key aspects of South Australia's contribution to the Air Force over the past 100 years. Also on display were artefacts provided by the South Australian Aviation Museum and a Sir Richard Williams display provided by the Moonta-based Sir Richard Williams RAAF Centenary Celebrations Committee (see page 14 for more).

WOFF Scott Brown, Base Warrant Officer RAAF Edinburgh, gave a moving speech and toast honouring our nation's over 3,000 missing airmen whose remains have never been recovered. That was complemented by a Welcome to Country by FLTLT Steven Warrior, the RAAF Indigenous Liaison Officer, a proud Kaurna, Narungga and Kokatha man. GPCAPT Greg Weller, Director Community Engagement at RAAF Edinburgh, provided a poignant overview of South Australia's contribution to the Air Force and the sacrifices of SA airmen and an outline of what the centenary will look like in the state. The evening concluded with a keynote address by Premier Marshall, looking to the future.

The Air Force Association (SA) is working with other organisations such as the Royal Aeronautical Society and RAAF in commemorating the Air Force Centenary through a community-based program of events in 2021. For more information about Air Force Centenary events in SA, visit the Air Force Association (South Australia) Facebook page (facebook.com/raafasa).

BELOW SA Premier Steven Marshall delivering the key note address at the Sir Ross and Sir Keith Smith Dinner in Adelaide.

Dr Robert Black, President Air Force Association (SA), farewells AIRCDRE Buck Rogers.

Farewell
AIRCDRE BUCK ROGERS

ON 18 JANUARY, the Air Force Association (South Australia) was honoured to have South Australian Governor Hieu Van Le and Premier Steven Marshall join members of the SA veterans' community to farewell AIRCDRE Buck Rogers as the outgoing Commander Air Warfare Centre/Senior ADF Officer Edinburgh and welcome AIRCDRE Ross Bender as the incoming Commander.

Both guests provided warm farewell speeches acknowledging the work and career of AIRCDRE Rogers.

AFA-SA President Dr Robert Black acknowledged the career of AIRCDRE Buck Rogers, noting he has been a wonderful friend of the Association in supporting the Air Force family. Dr Black particularly noted the Air Force's support partnering in ceremonies such as the annual Battle of Britain, Bomber Command and Air Force Birthday commemorative services, which have become highly regarded and well attended.

AIRCDRE Rogers transferred from the Permanent Air Force to the Reserves on 21 January, completing 34 years of service. During that time, he was awarded the Conspicuous Service Cross (2014) and the Conspicuous Service Medal (2018).

Town honours
SIR RICHARD WILLIAMS

MOONTA IS A SMALL TOWN on the western coast of the York Peninsula, South Australia. It was a centre for copper mining in the 19th century and today, it is a rural town and a popular holiday spot. It is also the home of Sir Richard Williams.

To celebrate the Air Force Centenary and the importance of its famous son, Moonta has initiated a project to erect a bronze sculpture of Sir Richard Williams in Moonta's Queen Square. The life-size sculpture will show Sir Richard sitting on a park bench looking into the sky, allowing people to sit beside him and be inspired by this great South Australian.

Beside the bench will be a bronze plaque mounted on a copper mine rock to reflect Williams' Cornish mining heritage and provide the history of his professional life. The sculptor, Tim Tomson, also created a sculpture of South Australian aviator Harry Butler which is on display at Minlaton on the York Peninsular.

The Moonta sculpture will be unveiled on 29 August as the key event of a day's activities celebrating the Air Force Centenary and the life of Sir Richard Williams. The Air Force Association (South Australia) is working closely with the Moonta team on the initiative.

If you would like to contribute to the initiative, contact Robyn Knight, Chair of the Sir Richard Williams Air Force Centenary Committee, on 0409 007 054 or visit the website saheritagefoundation.com.au/appeals/moonta-heritage-foundation.

• To learn more about Sir Richard Williams, turn to page 25.

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EDITED BY John Kindler

German Australian cooperation
TO AID SPACE RESEARCH

THE GERMAN AEROSPACE CENTRE (DLR) and Australia's Southern Launch have evolved a previously signed memorandum of understanding and struck a cooperation agreement to implement joint civilian research into suborbital and orbital space launch, especially of reusable launch vehicles (RLV). The agreement followed the successful launch of two space capable DART rockets by Southern Launch at the Koonibba Test Range in South Australia last September.

DLR is considering Southern Launch's Koonibba Test Range for evaluating new rocket technologies and launch equipment. It is working with Southern Launch toward launching the first DLR research mission in mid 2022.

The two organisations are also working to establish an educational sounding rocket program in Australia, allowing universities to undertake space-based research projects from the Southern Hemisphere.

Source: satnews.com

BELOW LEFT Artists Impression of DLR's Reusability Flight Experiment in space.

BELOW TED-01 lift-off on 19 September 2020 from the Koonibba Test Range, followed shortly after by TED-02. Both rockets carried payloads for DEWC Systems.

UPGRADES FOR GLOBAL HAWK

Global Hawk.

NORTHROP GRUMMAN has delivered a pair of sensors to enhance the capability of the US Air Force's Global Hawk high-altitude, long-endurance autonomous aircraft system.

Enhancements include the deployment of the MS-177 multi-spectral camera system and the first fielding of the increment 1 upgraded AN/ASQ-230 system to counter expanded electronic threats.

Global Hawk is uniquely positioned for additional missions that connect the joint force as one, including persistent high-capacity backbone, pseudo-satellite communications coverage and joint all-domain command and control.

Source: Defence Connect

Norway orders

AUSTRALIAN JSM SENSORS

NORWEGIAN KONGSBERG DEFENCE AND AEROSPACE has placed a purchase order with BAE Systems Australia for an initial batch of passive radio frequency sensors for the Joint Strike Missile (JSM).

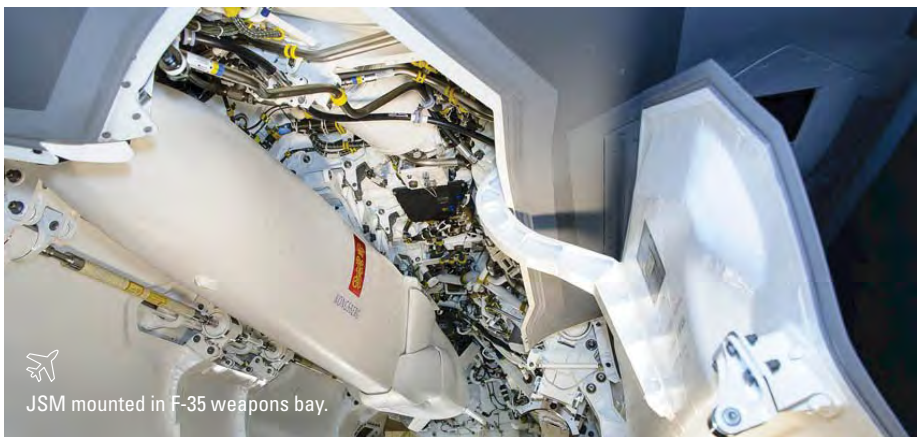
The order, the first full-rate production order of the sensors, is part of a broader co-operation agreement between Kongsberg and BAE Systems Australia.

Since receiving initial funding from the Australian Government in 2013, Kongsberg and BAE have invested in the qualification and integration of the Australian sensor into the JSM, in a bid to provide additional capability to the fifth-generation, long-range, precision-guided, stand-off missile system.

The purchase order follows a set of flight trials that, according to BAE Systems, demonstrated the "successful integration" of the electronic systems into the missile.

Kongsberg's JSM is designed for use against maritime and land targets and is the only anti-ship cruise missile that can be carried internally by the F-35 Joint Strike Fighter.

Source: Defence Connect



JSM mounted in F-35 weapons bay.

PREPARING FOR TRITON

NORTHROP GRUMMAN CORPORATION has completed Phase 1A – initial development – of the MQ-4C Triton Network Integration Test Environment (NITE) at RAAF Base Edinburgh, SA. That means Chief Information Officer Group (CIOG) can begin developing the Triton network design and test basic network configuration settings. Northrop Grumman Australia will develop NITE in three phases, allowing CIOG to progress from basic continuity testing between distributed environments to an advanced integrated environment.

"With Air Force embracing leading edge technology in the form of the remotely piloted MQ-4C Triton, there is now a reliance on assured data flows between the air vehicle and those who operate it on the ground and disseminate what we see," said CIOG director general Air Commodore Leon Philips. "The NITE offers CIOG the earliest opportunity to ensure those data flows are established and verified well before our first aircraft arrives."

Defence unfazed by SKYGUARDIAN HICCUP

THE DEPARTMENT OF DEFENCE has confirmed it is developing options for up to 12 General Atomics MQ-9B (SkyGuardian) remotely piloted aircraft (RPA) to present for second pass government approval in 2022, as part of Project AIR 7003 – a $1.3 billion program to deliver an armed RPA system to the Australian Defence Force.

The initiative will be progressed despite General Atomics' failure to demonstrate the aircraft's capability in urban environments, and the manufacturer forced to cancel a test flight in San Diego earlier this year in response to community pushback.

According to Defence, concerns over regulatory compliance, aviation safety and airworthiness would be addressed "well ahead of achieving initial operating capability", currently scheduled for the "mid-2020s".

"The variant of SkyGuardian Defence is purchasing will be certified to similar standards as manned aircraft to ensure the safety of people on the ground and other airspace users," a Defence spokesperson told *Defence Connect,* noting that in Australia, qualification tests would be guided by the Defence Aviation Safety Regulations, rather than Civil Aviation Safety Regulations. Defence works closely with the Civil Aviation Safety Authority (CASA) to ensure Defence regulations are compatible with CASA's guidelines.

SkyGuardian is expected to provide persistent intelligence, surveillance, reconnaissance and electronic warfare support and precision strike to multiple domains. The aircraft can continuously observe a wide area for an extended period, supporting national security objectives and providing reconnaissance support to search and rescue, humanitarian assistance and disaster relief operations.

Source: Defence Connect

MQ-9B SkyGuardian.

Collaboration lets full power of F-35 LOOSE

A TEAM OF DEFENCE SCIENCE and Technology (DST) scientists and engineers played a pivotal role supporting the research and development conducted by the US Air Force Seek Eagle Office at Eglin Air Force Base in Florida to enhance the lethality of the F-35 Joint Strike Fighter.

DSTG engineer Regina Blyth has led the development of a computational aerodynamics modelling capability for the external and internal carriage and release of weapons from the F-35A.

The modelling tool has been fully validated and allows a greater range of weapons to be integrated onto the F-35A without the need for expensive physical testing.

Source: Defence Connect

Northrop Grumman teams with Airbus

NORTHROP GRUMMAN AUSTRALIA and Airbus Australia Pacific have entered into a strategic teaming agreement to cooperate in delivery of advanced and optimised MQ-4C Triton sustainment capabilities at RAAF Base Edinburgh, SA.

Australia is scheduled to receive the first Triton ground control station in 2022 and the first of six to seven Triton air vehicles in 2023.

Northrop Grumman is already building long lead items and is scheduled to begin building the airframe for Australia's first air vehicle later this year.

Triton will be equipped with a unique and robust mission sensor suite that provides 360-degree coverage by all sensors, providing unprecedented maritime domain awareness for the US Navy and the RAAF.

Triton is designed to operate in conjunction with Australia's planned fleet of 12 manned P-8A Poseidon maritime patrol and anti-submarine aircraft. Based on the Global Hawk, Triton's autonomous operations are supported by land-based command and control mission planners and sensor operators.

Flying out of Edinburgh, the Triton is capable of monitoring 5.2 million sq.km in a 24-hour mission and flying a round trip to provide sustained surveillance in support of allied freedom of navigation operations in the South China Sea.

The facilities and crew required to operate, train and maintain the Triton surveillance capability will be part of an initial $1.4 billion investment, which includes $364 million on new facilities at RAAF Bases Edinburgh and Tindal, NT.

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RTO No. 30770 | CASA.147 MTO 0025

Sikorsky approved FOR TRAINING

SIKORSKY AUSTRALIA has been officially approved as an Aircraft Maintenance Training Organisation (MTO) and is now eligible to deliver type course aircraft training to its staff, defence and industry partners under Defence Aviation Safety Authority (DASA) regulations.

Training for Sikorsky and defence personnel on MH-60R (Romeo) and S-70A-9 (Black Hawk) helicopter platforms in both avionic and mechanical trade categories is now authorised.

The MTO program was developed by a team of Sikorsky's aviation instructors in collaboration with DASA to ensure all elements of the training program aligned with Defence Airworthiness Safety Regulations Part 147 standards.

"To be recognised as an MTO and meet Australia's strict aviation training regulations, which are seen as a benchmark by many nations, is an important outcome for Sikorsky Australia and our customers," said Sikorsky Australia general manager Dale Hall. "DASA's in-depth advice and ongoing support during our path of creating the training courseware was invaluable in helping us achieve this positive outcome."

Sikorsky's maintenance and support facility at the Albatross Aviation Technology Park houses through-life-support services for the Royal Australian Navy's fleet of 24 Romeo maritime helicopters and support for the Army's Black Hawk helicopters.

ABOVE Technicians inspect a helicopter rotor control system at Sikorsky Australia's Brisbane facility.

Air Fab contract FOR AIRCRAFT SAFETY STANDS

VICTORIA-BASED AIR FAB has received a $1.3m contract with Boeing Defence Australia to design and build aircraft safety stands to be used in the maintenance of RAAF F/A-18F Super Hornets and EA-18G Growler aircraft.

"With eight employees, Air Fab is an excellent example of the ingenuity of Australian small business in helping not only keep our personnel safe, but in helping to get Australia's frontline fighter aircraft back into the air quicker," said Defence Minister Linda Reynolds.

Source: airforce-technology.com

ABOVE RAAF F/A-18F Super Hornet *City of Ipswich*. Photo: Peter Bailey.

Quickstep to acquire Boeing's MRO capability

QUICKSTEP HAS ANNOUNCED plans to acquire Boeing Defence Australia's (BDA) maintenance, repair and overhaul (MRO) capability, based at Tullamarine, Victoria.

Under the terms of the asset purchase agreement, Quickstep will acquire operating assets plus inventories and certain customer contracts from Boeing Australia Component Repairs (BACR) through its subsidiary Quickstep Aerospace Services. Quickstep has also offered to onboard certain BACR employees and has agreed to assume liabilities for transferring employees and certain other business liabilities.

Quickstep, which has recent experience working with Boeing, Airbus, Embraer and Bombardier aircraft, F/A-18A/B Classic Hornets, F/A-18F Super Hornets, C-130J Hercules and CH-47 Chinooks, intends to leverage its existing relationships and capabilities to broaden the scope of MRO work offered to include F-35 and other military and commercial work.

BDA and Quickstep have also agreed to consider a long-term agreement that would develop a broader, ongoing collaboration in both the military and commercial aerospace segments.

Source: Defence Connect

ABOVE Mark Burgess CEO and MD Quickstep and Scott Carpendale VP and MD BDA.

Aerospace SCHOLARSHIPS

TWENTY STUDENTS from across Australia have been awarded scholarships from the Australian Youth Aerospace Association (AYAA), supported by Raytheon Australia. The Australian Youth Aerospace Leader scholarship was offered to school students in Years 10 to 12 with a keen interest in aerospace or avionics, while the Australian Youth Aerospace Scholar category was open to students in their first year of an engineering degree at any Australian university.

Each recipient will receive $1,000 toward their education and professional development. Three recipients will also receive mentoring from a Raytheon Australia engineering expert.

AYAA is a not-for-profit organisation managed by student volunteers and young professionals to promote education and involvement in the aerospace industry. It hosts several major annual events, including the Australian Universities Rocket Competition.

Air-breathing hypersonic technologies

AUSTRALIA AND THE US have joined on the Southern Cross Integrated Flight Research Experiment Allied Prototyping Initiative to develop air-breathing hypersonic technologies, essential to the future of hypersonic flight.

The program, to be executed by the US Department of the Airforce, aims to build complete and affordable prototypes and offer a flexible, long-range capability, leading to flight demonstrations. Additionally, it will work at exploring potential opportunities for co-production between the two countries and will use the collaborative hypersonic activities embedded in the Hypersonic International Flight Research Experimentation program.

Source: airforce-technology.com

Future fighter FOR JAPAN

JAPAN HAS REVEALED more details of its in-development, next-generation fighter aircraft. Driven largely by advances in capabilities by Russia and China, Japan has sought to respond with a combination of the F-35 and a domestically produced sixth-generation air superiority fighter.

It is envisaged that the next-generation fighter, now named the F-X, will fill the role of the retiring F-15J operated by the Japan Air Self Defence Force, with the F-35A and B variants providing the low-end air-combat capabilities currently assigned to the F-16-based F-2 aircraft.

The Japanese Government has awarded Mitsubishi Heavy Industries the contract to develop the aircraft, with prototype flights expected by 2028 and full-scale production by 2030-31.

The government has insisted the fighter incorporate a stealthy design and emphasised interoperability with US fighter assets, including the F-22 and F-35. The Japanese have also insisted on the future fighter having a single priority: air-to-air combat.

F-X will be capable of directing up to three loyal wingman combat drones and is expected to be armed with the Joint New Air to Air Missile being co-developed with the UK.

Source: World of Aviation

Artists impression of Japan's F-X.

AIR FORCE

AN INDEPENDENT

Imperial Gift DH.9a bombers.

IN THE CENTENARY YEAR OF THE ROYAL AUSTRALIAN AIR FORCE, WINGS BEGINS A FOUR-PART SERIES OF EDITED EXCERPTS FROM THE RAAF PUBLICATION *THE AUSTRALIAN EXPERIENCE OF AIR POWER.*

THE RAAF TRACES its history back to the Australian Flying Corps (AFC), which was established in September 1912 and commenced flying operations at Point Cook on 1 March 1914.

At the close of World War I, AFC squadrons were disbanded and their aircraft and equipment in Europe and Palestine returned to the Royal Air Force (RAF). That reduced Australia's military aviation capability to domestic forces, established largely as a training organisation centred on Point Cook, pending the arrival of Britain's Imperial Gift that included 128 aircraft and 258 vehicles.

The Australian Air Corps (AAC) was formally instituted within the Commonwealth Military Forces on 1 January 1920 as an interim body to provide for the maintenance of existing equipment until a permanent organisation was created. Apart from some training and public flying displays, the AAC also carried out aerial route surveys.

In September 1920, an allocation of funds and the creation of an efficient air force and commercial air services were announced by Prime Minister William Morris (Billy) Hughes, who declared himself 'a fanatic' in his personal belief in aviation.

FORMATION OF THE RAAF

Despite the enthusiasm of the Prime Minister, the government dithered over the final step to raise an Air Force, apparently through a reluctance to actually spend money on Defence. Realising that situation might continue indefinitely, Lieutenant Colonel Richard Williams, the principal military adviser on air matters, seized on the government's stated desire to use military aircraft to trial an air mail service to some of Australia's more remote areas. Aware of ministerial impatience, Williams advised that trials of an air mail service could not begin until the proposed air force had been formally established.

With that argument, Williams was able to win approval to inaugurate the Australian Air Force on 31 March 1921. The prefix 'Royal' was added to the new service's name on 13 August 1921.

The aircraft received in the Imperial Gift were sufficient to form six RAAF squadrons: four of landplanes and two of seaplanes. The original plan was to base three squadrons in New South Wales and three in Victoria, but that plan had to be modified almost immediately due to a change in the government's financial policy. The number of squadrons was reduced to five. Even that diminished plan had to be abandoned in the wake of international treaties signed at the disarmament conference held in Washington, DC, later that year.

In July 1922, the five squadrons created the previous year were merged into a single mixed squadron, No.1 SQN, at Point Cook. For the next two years, the strength of the RAAF remained at about 50 officers and 300 airmen, far short of the 1,500 originally planned. As Williams told a parliamentary committee at that time, "Our present staff is really a nucleus and quite inadequate alone to effectively serve in the case of a possible emergency".

In 1924, an Experimental Section, commanded by Squadron Leader Lawrence J. Wackett, was set up at Randwick, Sydney, to undertake

Fairey IIID seaplane.

technical research and aircraft design work. The unit was disbanded in 1930.

In 1925-26, two new bases were established. The first was at Laverton, Victoria, to accommodate a depot unit and No.1 SQN, which relocated from Point Cook. The second was the former NSW Government airfield at Richmond, which was turned into a permanent base for a second operational unit, No.3 SQN. When Nos 1 and 3 Squadrons were formed on 1 July 1925, Citizen Air Force personnel made up nearly two-thirds of their establishment. Those two bases and squadrons formed the backbone of the RAAF's operational capability for more than a decade.

Nos 1 and 3 Squadrons had been formed as composite units allowing both army cooperation and air defence roles to be exercised in both New South Wales and Victoria.

By the end of the 1920s, the store of Imperial Gift machines was exhausted or had to be retired due to deterioration while in storage. The multiple aircraft types operated by each squadron were replaced by the Westland Wapiti, a general purpose aircraft. No.1 SQN then began to specialise as a bomber Unit, while No.3 SQN formalised its primary role as army co-operation.

Flights of seaplanes and fighters were used to sustain other core skills considered vital to the RAAF's purpose, but only in cadre form. By default, the RAAF had become a training organisation with a limited combat capability. The government expected that in the event of a defence emergency the service would expand by calling upon its Citizen Air Force component and the resources of civil aviation.

AIR DEFENCE SCHEME

In April 1925, the Chief of the Air Staff (CAS), Wing Commander Williams, had written a memorandum regarding the air defence of Australia in which he put forward the case for a nine-year program to increase the RAAF to 18 squadrons and a dozen flights and to provide an Air Force presence in every state. Although the document was written to establish the theoretical basis for the Air Force, Williams did not define how the markedly bigger Air Force would operate to assist in the defence of Australia, especially given the limitations in range and capability of available aircraft types.

The response of the nation's political leaders was largely to ignore Williams' scheme, clearly displaying their limited understanding of, and indifference to, air power's potential. However, by failing to clearly articulate the doctrinal dimension in his argument and ignoring political aspects, Williams' contribution to the debate was less than he imagined.

Unable to persuade his political masters on his own, Williams appealed to RAF authorities for expert advice,

TRAINING AND CIVIL TASKS

Throughout the 1920s and 1930s, the RAAF provided training in air co-operation during militia training camps for the Army, and as embarked detachments on RAN warships during annual cruises of the region. A large part of the service's time was also taken up with public-relations tasks such as air displays and aerial races.

Equally demanding was a range of non-military tasks such as: responding to requests from civil agencies for aerial photography; mapping surveys, notably of Central and Northern Australia; supporting forestry development through aerial surveys, bushfire patrols and aerial dusting; daily meteorological flights; assisting with scientific study of pelagic fish movements in coastal waters and oil exploration around Australia and in New Guinea; helping to chart the Great Barrier Reef; search and rescue of lost sea and air parties; and even participating in the exploration of Antarctica.

believing that Australian governments were more likely to be influenced by an opinion coming from London. Accordingly, he engineered a visit in 1927 by a senior British officer to review the RAAF.

Air Marshal Sir John Salmond's report confirmed, as Williams must have known it would, that the RAAF was totally unfit for war, and outlined a development program aimed at building up the service to a credible level. As Salmond's recommendations were more modest than his own plan, Williams expected to see it adopted in full, but the government was only interested in implementing some of the proposals. Williams' recourse to invoking British authority carried a significant risk by appearing to confirm a wider perception that the RAAF was simply an offshoot of the RAF, functioning as a local branch of the British service.

The impression of subservience to British influences was true in many regards. The RAF was the standard on which the Australian air service modelled itself, from its traditions and organisation to its equipment and training. For instance, the RAAF was obliged to adopt the RAF Ensign even though it had proposed its own design (see page 26).

From 1926, the RAAF had sent a proportion of its pilots from Point Cook flying courses to receive further training in Britain. To the detriment of the RAAF, many of those pilots subsequently transferred to the RAF. For more than a decade, there was little effort to consider defence issues from a uniquely Australian perspective. In most instances, advice received from London regarding the development of the RAAF was accepted without question. Even when fending off attempts to have the Air Force disbanded and dispersed between Navy and Army, the RAAF simply invoked the arguments advanced by the RAF in answering similar moves against it in Britain. Unfortunately, those arguments were advanced without any of the intellectual underpinnings used by the formidable British CAS, Air Chief Marshal Sir Hugh Trenchard.

In Australia, there was no debate comparable to that which had been occurring in Britain, Europe and America after WWI regarding the best means of applying air power, whether there was an independent role for air forces and whether air power alone could be a war-winning factor. The foremost air power theorists abroad, men such as Italy's Giulio Douhet and Billy Mitchell of the United States Army, were essentially unknown identities to members of the RAAF. The closest Australia had to a homegrown student of air power in the 1930s was Group Captain H.N. Wrigley, who kept detailed personal notebooks about the ideas to which he was exposed in the course of his career.

REARMAMENT

The RAAF's status as an independent service began to change dramatically from the mid-1930s as the world emerged from the Depression and entered a period of rearmament in response to the growing menace posed by Fascism in Europe. From 1935, the RAAF underwent a period of rapid expansion. In four years, it trebled its personnel to more than 3,000 and added 10 squadrons to its order of battle. Additional permanent bases were established at Perth and Darwin, and a temporary base was created near Brisbane, pending construction of a new Queensland base at Amberley. New stations were also planned for Rathmines on Lake Macquarie, NSW, and at Canberra.

Ideas about employing air power in the Australian context began to evolve as the RAAF expanded. In September 1935, Squadron Leader J.P.J. McCauley, of the Chief of Staff Branch, instructed staff at all RAAF bases to draw up local defence schemes and to prepare papers on specified subject areas related to their particular role. All officers below the rank of Flight Lieutenant were

FATHER OF THE RAAF

Even though a number of Australians rose to tactical command positions during WWI, no Australian advanced beyond leading an operational wing of several squadrons. Of the four who reached that level, only one was an Australian Flying Corps officer, Richard Williams, who in June 1918 commanded 40th (Army) Wing of the Royal Air Force (RAF) brigade in Palestine.

Williams was one of the Service's two senior officers when the RAAF was formed in March 1921 and became the first Chief of the Air Staff (CAS) when that post was created in October 1922. He remained CAS for a record 16 years, departing on exchange with the RAF in early 1939. During his tenure as CAS he had risen from the rank of Wing Commander to Air Vice-Marshal.

In 1940, Williams returned to a senior administrative post in Australia with the temporary rank of Air Marshal but did not lead the RAAF again. In 1946, he left the Air Force and became Director General of Civil Aviation until he retired in 1955. He was knighted in 1954.

TOP Sir Richard Williams.

LEFT Captain Henry Wrigley and Sergeant Arthur Murphy. Murphy became the RAAF's first airman (Airman No.1) when the Air Force was formed.

instructed to write a 10,000-word essay on how air power could be used in co-operation with fixed defences to protect Australia's vital assets. That process was, in effect, the first-ever attempt to formulate operational-level doctrine that was directly applicable to Australian circumstances. As a result of that initiative, an Air Staff Memorandum dealing with the tactical employment of air forces in the local defence of Australia was issued on 15 April 1936.

PREPARATION FOR WAR

The years before the start of WWII, in 1939, saw serious efforts to improve the operational capabilities of the Australian defence forces, which had atrophied during a prolonged period of neglect. However, critics who viewed Air Force during the inter-war years as little better than an exclusive flying club had a point. The RAAF was unprepared for active operations when war was declared.

The most obvious deficiencies were in equipment, especially modern combat aircraft, and personnel. There was also a less obvious but equally critical lack of doctrine for the effective employment of air assets. The magnitude of those shortcomings was about to be brought into sharp focus by the scale of the conflict in which Australia was obliged to join.

To be continued next edition

RAAF ENSIGN

On 21 July 1921, Wing Commander Richard Williams submitted a proposal for a RAAF ensign. His design was not adopted and, a year later, the Air Board approved the British Royal Air Force Ensign, a sky-blue ensign with the RAF roundel in the fly, as the Ensign of the RAAF.

In December 1948, to avoid confusion between the two air forces, King George VI approved a new RAAF ensign. The new flag had the roundel in the lower fly of a sky-blue Ensign with a Commonwealth Star and tilted Southern Cross. It was adopted by the RAAF in 1949. Although the RAAF adopted a distinctive roundel for its aircraft on 2 July 1956 – a red kangaroo replacing the red circle, the old roundel remained on the ensign.

In 1981, the RAF roundel was replaced on the RAAF Ensign by a new roundel featuring a red leaping kangaroo on a white background within a dark blue ring. The design was approved by the Queen in 1981 and proclaimed as a Flag of Australia under the Flags Act on 6 May 1982.

ABOVE Design for the original RAAF Ensign that was not approved.

CENTENARY COMMEMORATION

COVID-19 RESTRICTIONS HAVE PLAYED HAVOC WITH PLANS FOR THE AIR FORCE'S CENTENARY IN 2021, BUT THE AIR FORCE 2021 TEAM IS FORGING AHEAD WITH COMMEMORATIONS.

AIR FORCE 2021 activities across Australia will highlight the contribution Air Force has made in all states and territories. Nationally, Air Force will conduct a major event in Canberra focused on presentation of a new Queens Colour for the RAAF on 31 March at Government House.

The original Queens Colour for the RAAF was presented on 17 September 1952 and the current Colour was presented by Her Majesty at RAAF Base Richmond in 1986. In addition to the Queen's Colour, the RAAF has six current Unit Queens' Colour, 28 Squadron Standards and 16 current Governors General Banners. All RAAF colours, standards and banners will be paraded and the ceremony will be endorsed by a large formation flypast of current and former Air Force aircraft.

The Colour Parade will be televised by the ABC from 10am local time around Australia, preceded earlier in the week by an hour-long ABC News feature exploring the century of Air Force composition and commitments.

The regular annual Australian War Memorial (AWM) commemoration ceremony will take place on Anzac Parade on 30 March. Air Force will also be honoured in the AWM's Last Post Ceremonies on 30 and 31 March. The AWM conducts a Last Post Ceremony each day, commemorating a fallen ADF serviceperson. The ceremonies can be viewed on the AWM website (awm.gov.au) at 4:45pm daily, and in most Queensland and Victorian RSL clubs. RAAF centenary ceremonies will be streamed live on the RAAF website (airforce.gov.au).

The 31 March ceremony will honour

Sergeant William Bernard Turly Godly, who was born in Lucknow, India on 31 March 1921, the same day the Australian Air Corps was separated from the Army to form the Australian Air Force.

William grew up in Victoria and enlisted on 23 June 1940 aged 19 years. He served with No.14 (RAF) Squadron as a Wireless Operator/Air Gunner and perished on operations in the Middle East (Bir El Baheira, Libya) on 17 March 1942, 14 days before his 21st birthday.

Sergeant Godly represents a link from the past to today's Air Force; almost 100 years after he was killed, Australian airmen would again be on operations in the Middle East. It is not impossible to imagine, had Sergeant Godly survived, he might be witness to the Centenary of the Air Force on his 100th birthday and would join with those airmen, who like him, served in the Middle East.

ABOVE The first Australian coin struck in 2021 commemorates the RAAF centenary. Three RAAF aircraft feature on the reverse side of the $1 coin, alongside a soaring wedge-tailed eagle as depicted on the Air Force crest.

ABOVE Australia Post has released commemorative stamps featuring RAAF aircraft: a 1921-era SE5A bi-plane and a F-35A Lightning II. The minisheet depicts RAAF Base Point Cook with Richard Williams, the first chief of the RAAF, beside the SE5A.

AIR FORCE FAST FACTS

- Australia's air power began with the Australian Flying Corps which fought with distinction in the Middle East and on the Western Front in World War I. The Air Force has since served in WWII, Korea, Malaya, Vietnam, East Timor, Afghanistan and Iraq.
- More than 350,000 men and women have served as members of the Australian Air Force, Women's Auxiliary Australian Air Force, Women's RAAF, RAAF Nursing Service and RAAF.
- Of the 102,890 individuals recorded on the Australian War Memorial Roll of Honour, 206 were members of the Australian Flying Corps. In all, 11,191 Air Force personnel have lost their lives while serving Australia – 9,870 during WWII. Of the 11,191: 11,129 were RAAF (two women), 57 were WAAAF and five were RAAFNS. Of those, 3,125 personnel have no known grave and 18 are from the Korean conflict.
- Air Force today is an organisation of almost 21,700 individuals including 5,000 Reservists, supported by nearly 700 Australian public servants.
- Indigenous Australians comprise 2.5 percent of the RAAF and people with the heritage of 111 nationalities make up the Air Force in 2021.
- The RAAF operates from 17 bases, including RAAF Bases Curtin, Learmonth, Scherger and Woomera.
- The oldest unit is the Central Flying School, formed in 1913, disbanded in 1919 before the formation of the RAAF, and reformed in 1940.
- No.1 Flying Training School was the first unit formed after the Australian Air Force was established in 1921.

AF2021 ACTIVITIES

ALL STATES & TERRITORIES
March 31: Queen's Colour Parade
April: ANZAC Day

QUEENSLAND
August: Freedom of Entry Parade, Ipswich

NORTHERN TERRITORY
May: Tindal Community Open Day
July: Darwin Show and Katherine Show
August: Victory in the Pacific Day Commemoration – Coomallie Airield
November: Remembrance Day

VICTORIA
November: Remembrance Day, RAAF 2021 Memorial Point Cook and AIA International Avalon Airshow

WESTERN AUSTRALIA
April: Bullsbrook Show and RAAF reception City of Geraldton
May: Freedom of Entry Perth, Air Force anniversary reception RAAF Learmonth
June: WA Day, Perth
July: Exmouth Community Day
November: Remembrance Day, Busselton-Margaret River Open Day
December: Pearce Family and Community Day

NEW SOUTH WALES
April: Hawkesbury Show
May: Bomber Command Anniversary
July: Hawkesbury Festival, Freedom of Entry Wagga
August: Airshow over Newcastle
September: Freedom of the City, Richmond, Newcastle
October: RAAF Base Richmond Family Day, RAAF Empire Aircrew Memorial Wagga
November: Remembrance Day

TASMANIA
September: National Battle of Britain Day
November: Remembrance Day

SOUTH AUSTRALIA
February to November: Rolling AF2021 displays at SA Aviation Centre
May: Freedom of Entry Adelaide, rolling series of heritage presentations as part of SA History Festival, Copper Coast Cornish Festival Moonta – Sir Richard Williams display and Aboriginal veterans Commemorative Service
June: Bomber Command Commemorative service Adelaide and RAAF Port Pirie Commemorative Service
August: VP Day Ceremony, Air Force Centenary Church Service, Sir Richard Williams Celebration Moonta.

For the latest information on AF21 activities visit the Air Force 2021 website, airforce.gov.au/100, which will keep pace with possible emerging COVID-19 restrictions.

HONOURING 100 YEARS OF THE ROYAL AUSTRALIAN AIR FORCE

Founded in values of service, courage, respect, integrity and excellence, the Royal Australian Air Force (RAAF) has been defending the people of Australia for the last century. Since 1927, Boeing and the RAAF have partnered to create next-generation products and push the boundaries of air defence. Boeing also proudly welcomes RAAF veterans into our workforce, where they continue to support Australia's defence. As enduring partners, we recognize the centenary of the RAAF and we look forward to many more years of partnership, innovation and protection.

boeing.com.au

BOEING

2021 AVALON ON FOR

AFTER BEING DELAYED, WORK IS IN FULL SWING TO STAGE THE AUSTRALIAN INTERNATIONAL AIRSHOW AT AVALON IN NOVEMBER.

THIS YEAR IS AN Avalon Airshow year. The COVID-19 epidemic caused the organisers to move the Australian International Airshow from its scheduled February 2021 dates to late this year, and preparation work is well underway.

This November, the premier aviation and aerospace event in the South Pacific will also celebrate the RAAF centenary. The skies above Victoria's Avalon Airport will erupt with all the latest military heavy metal, the boom of vintage warbirds, the whir of helicopters and the flash and thunder of precision manoeuvres and brilliant flying displays.

There will be as much happening on the ground as there is in the air. Take a journey back in time through RAAF historical diorama displays recreating scenes from Australian theatres of conflict through the decades. Visit the meticulously restored GAF Canberra Bomber Mk 20, A84-232, and learn how a dedicated band of volunteers saved a valuable piece of RAAF history.

There will be an ADF Military Working Dogs display and you can meet Belgian Shepherd (Malinois) puppies and learn how the "im-paw-tant" recruits will become the canine heroes of the future.

Housed in colossal expo halls, the Aviation and Aerospace Exposition will showcase more than 500 of the world's leading aviation and aerospace companies with stands of the latest products, inventions and military technology, plus a look into the aerospace future.

The RAAF centenary will bring together a cavalcade of Air Force assets, from vintage warbirds to aircraft of the future, including fifth-generation fighters. The array of aircraft will include Super Hornets, F-35s, Hawks, transport aircraft such as the C27 Spartan, C130 Hercules and the Giant C-17 Globemaster, surveillance aircraft such as Wedgetail and Poseidon and the PC-21 pilot training aircraft.

The airshow will also be the final public outing for the F/A-18 Classic Hornet. After a long and successful tenure with the RAAF, the Classic Hornet is being replaced by the F-35A Lightning II. The opportunity to look back on a bit of aviation history accords some context and understanding of how far the RAAF has come, mapping out the major leaps in aircraft design and capability.

In addition to RAAF assets, the Navy and Army will be represented with helicopters in the air and multiple

F-35A Joint Strike Fighters flying in formation with F/A-18 Hornets. Photo: CPL David Gibbs.

RIGHT
Paul Bennet SkyAces Wolf Pitts Pro.

BELOW
Worimi Classic Hornet. Photo: CPL Craig Barrett.

capability displays on the ground.

The skies will also host an incredible display of aerobatic acts and precision flying by some of the world's best aerobatic pilots, with barrel rolls, formation loops, head-to-head passes and precision flying.

For a flight down memory lane, a number of lovingly restored and rebuilt aircraft will soar skyward to strut their historic stuff.

• The Australian International Airshow 2021, Avalon Airport, Victoria Trade days: 23-26 November Public days: 26-28 November

JET GENERATIONS

The idea of aircraft "generations" as a classification was introduced in the 1990s as a way of grouping stages of development and improvements in fighter aircraft. The classification is only applied to jet-powered aircraft rather than earlier piston powered fighters and marks milestone developments in aerodynamic design, avionics and combat systems.

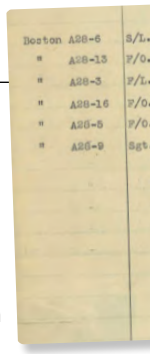
First generation generally refers to subsonic fighters, introduced in late World War II and spanning the mid 1940s to the mid 1950s. That generation of fighter was quite basic and comprised a relatively simple platform without radar or any sensor capability and with manually directed weapons. Their main armoury was cannons, unguided bombs and machine guns.

First-generation jet engines were typically non-afterburning. Examples flown by the RAAF included the Gloster Meteor and the Avon Sabre.

By the time the RAAF ushered in a fifth-generation capability, with the introduction of the F-35A Lightning II, military aircraft had evolved to new levels of combat performance combining stealth attributes, advanced avionics and highly integrated digital flight control and combat systems. Fifth-generation fighters were "born" networked, able to receive, share and store information to enhance awareness of the battlespace, making fifth-generation largely defined by software, rather than their hardware performance.

NEWTON VC AND THE BOSTON

IN THE RAAF CENTENARY YEAR, *WINGS* WILL RECOUNT THE STORIES OF THE FOUR AUSTRALIAN AIRMEN AWARDED THE BRITISH COMMONWEALTH'S HIGHEST AWARD FOR VALOUR IN THE PRESENCE OF THE ENEMY, THE VICTORIA CROSS. WE BEGIN WITH FLTLT BILL NEWTON, THE ONLY MEMBER OF A RAAF UNIT TO RECEIVE THE VC.



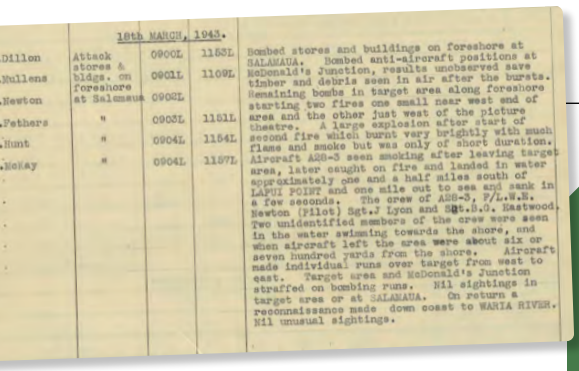
ON 16 MARCH 1943, a fortnight after taking part in the successful Battle of the Bismarck Sea near New Guinea, No.22 Squadron launched seven Douglas Boston light bombers from Wards Strip at Port Moresby. Supporting the coming Allied assaults on Lae and Salamaua on the north-east coast, their mission was a low-level attack on Japanese fuel dumps, stores and buildings at Salamaua.

Leading the strike in Boston A28-7 was Flight Lieutenant William Ellis 'Bill' Newton, with his crewmen FLTSGT Lyon and SGT Eastwood. Flying straight in towards the target through heavy anti-aircraft fire, their aircraft was hit badly and one engine knocked out. Regardless, the crew succeeded in destroying two 180,000-litre fuel tanks along with stores and buildings. On one engine, Newton managed to fly over the Owen Stanley mountains back to base.

Two days later they returned to Salamaua in Boston A28-3. It was Newton's 52nd sortie in 10 months of operational flying. Successfully bombing the targeted building, the Boston was hit by ground fire and caught alight. Newton brought the burning aircraft onto the water further down the coast, a mile offshore and other airmen saw two men swim to shore.

The fates of the three crewmen were not known until September when Salamaua was captured by the Allies. Newton's body was found buried in an unmarked bomb crater. It was revealed that he and Lyon had managed to evade the Japanese for a day before being captured and interrogated. They were taken to Lae, where Lyon was bayoneted to death. Newton was returned to Salamaua and beheaded on 29 March. Not long afterwards, he was posthumously awarded the Victoria Cross for his fearless attacks. SGT Eastwood was not found and was presumed to have died in the aircraft.

No.22 SQN moved to Goodenough Island to join the fight for New Britain and continued to fly Bostons until the end of 1944 when it re-equipped with Beaufighters. Newton's medals were donated by his mother to the Australian War Memorial, where they are displayed in the Hall of Valour.



18th MARCH, 1943.

Dillon	Attack stores & bldgs. on foreshore at Salamaua	0900L	1155L	Bombed stores and buildings on foreshore at SALAMAUA. Bombed anti-aircraft positions at McDonald's Junction, results unobserved save timber and debris seen in air after the bursts. Remaining bombs in target area along foreshore starting two fires one small near west end of area and the other just west of the picture theatre. A large explosion after start of second fire which burnt very brightly with much flame and smoke but was only of short duration. Aircraft A28-8 seen smoking after leaving target area, later caught on fire and landed in water approximately one and a half miles south of LAPUI POINT and one mile out to sea and sank in a few seconds. The crew of A28-8, F/Lt.W.E. Newton (Pilot) Sgt.J Lyon and Sgt.R.G. Eastwood. Two unidentified members of the crew were seen in the water swimming towards the shore, and when aircraft left the area were about six or seven hundred yards from the shore. Aircraft made individual runs over target from west to east. Target area and McDonald's Junction straffed on bombing runs. Nil sightings in target area or at SALAMAUA. On return a reconnaissance made down coast to WARIA RIVER. Nil unusual sightings.
Mullens		0901L	1109L	
Newton		0902L		
Fethers	"	0903L	1151L	
Hunt	"	0904L	1154L	
McKay	"	0904L	1157L	

ABOVE No.22 SQN unit diary account of the day Newton and crew were shot down. Courtesy National Archives of Australia.

LEFT FLTLT Bill Newton beside a Wirraway training aircraft with an ammunition belt draped around his neck. Photo: AWM.

DOUGLAS A-20C BOSTON TECHINICAL DATA

ROLE: Three-seat light attack bomber

POWER PLANT: Two Wright R-2600 Cyclone air-cooled radial engines of 1,600hp each

DIMENSIONS: Wingspan 18.69m, length 14.48m

WEIGHTS: Empty 6,827kg, loaded 10,660kg.

MAX SPEED: 544km/h

RANGE: 1,200km

SERVICE CEILING: 27,600ft

ARMAMENT: Four 0.303-inch and four 0.5-inch machine-guns in nose, twin hand operated 0.303-inch machine-guns in dorsal and one in ventral positions. Bomb load 907 kg (2,000 lb).

BOSTON FLOWN BY FLTLT NEWTON

Fortuitously, of the 69 Douglas Boston bombers flown by the RAAF in World War II the only one remaining was flown by FLTLT Newton on two attack operations – 18 and 22 February 1943 – as well as by WGCDR Keith Hampshire DSO DFC (Commanding Officer of No.22 SQN) and WGCDR Charles Learmonth DFC & Bar (after whom RAAF Base Learmonth, WA is named). The aircraft is displayed at the RAAF Museum at Point Cook, Victoria.

This DB-7B Boston, serial A28-8, was among a batch intended for the Netherlands East Indies Air Force in Java. With the Japanese occupation, it was diverted to Melbourne for the RAAF in April 1942. On delivery to No.22 SQN, the primary RAAF squadron to use the type, at Port Moresby at year's end, the aircraft was allocated the code letters DU-J (J for Jessica).

The following July, the squadron transferred to Goodenough Island. On 12 September 1943, Boston A28-8 crash-landed there after receiving battle damage over the Gasmata airfield in New Britain.

In 1987, its airframe was salvaged from the island by a RAAF team and Chinook helicopter and returned to Australia aboard HMAS *Tobruk*. A US Army Air Force A-20G Boston, forced down by bad weather in April 1944, had earlier been recovered from New Guinea. Both Bostons were restored to static display standard by a team at RAAF Base Amberley under GPCAPT L.J. Armstrong, who completed them in time for the 75th anniversary of the RAAF in 1996. Fittingly, present for the dedication of the two aircraft was A28-8's last pilot, FLGOFF Harold Rowell. The American A-20G (*The Hell 'N Pelican II*) is displayed at RAAF Amberley Aviation Heritage Centre, while in 1998 Boston A28-8 was trucked to Point Cook.

• *With thanks to Kevin McGuirk, vice president of the 22 Squadron Association, who together with the president, Harold Rowell, and members, was instrumental in advocating for and organising the recovery of A28-8 Jessica to Australia.*

ABOVE LEFT Boston A28-8 at RAAF Museum Pt Cook. Photo: James Kightly.

A LONG ASSOCIATION

INTERNATIONAL AEROSPACE COMPANY BOEING HAS BEEN OPERATING IN AUSTRALIA FOR MORE THAN 90 YEARS, WITH A BROAD RANGE OF LOCAL SUBSIDIARIES.

BOEING IS UNIQUE in the Australian aerospace industry. Renowned on the international stage, Boeing employs a national workforce in a mix of commercial and defence business, original research and development activities, and an extensive domestic supplier network, Boeing is a substantial Australian company in its own right.

"For more than 90 years, Boeing in Australia has been built by Australians for Australians," says Brendan Nelson, president of Boeing Australia, New Zealand and the South Pacific.

"The Boeing brand is synonymous with commercial aircraft, of course, but the company's portfolio of aerospace products and services and contribution to the defence of our nation makes us much more than that."

Boeing's Australian entities comprise Boeing Australia Holdings, Boeing Aerostructures Australia, Boeing Defence Australia, Aviall Australia, Boeing Distribution Services and Insitu Pacific. In total, the business employs more than 3,800 people across the nation.

In 1956, Qantas became the first international customer to acquire the Boeing 707, prompting the establishment of the first Australian commercial airline support office in 1959. Since then, the commercial arm has thrived, supporting Qantas, Jetstar, Virgin Australia, Air New Zealand and other regional airlines on aircraft ranging from the 717, 737 Classic and Next-Gen, 747 to the 787 Dreamliner and 777-300ER.

But Australia's contribution to Boeing's commercial airplane business extends well beyond supporting the region's passenger airlines. Through its subsidiary, Boeing Aerostructures Australia (BAA), the company designs and manufactures structural composite aircraft components, 100 percent of which are exported to Boeing's final assembly sites in the United States.

"Boeing employs more than 700 people at our factory at Fishermans Bend in Melbourne," says BAA managing director Jose Garza. "We design, test, certify and manufacture advanced composite structures for some of the most technically advanced commercial aircraft in the world – including trailing edges for the Boeing 787 Dreamliner."

The trailing edges are manufactured using a pioneering resin infusion system enabling components to be cured without an autoclave. BAA is the only location in the world to apply the infusion technique that delivers infrastructure, labour, energy and weight efficiencies, and ultimately contributes to fuel saving.

CUTTING-EDGE INNOVATION

Innovation such as BAA's resin infusion system were achieved in partnership with the on-site R&D arm, Boeing Research and Technology-Australia (BR&T-Australia). BR&T-Australia provides innovative technologies to improve the technical risk, cycle time, cost, quality and performance of current and future aerospace systems. It spans numerous parts of Boeing's businesses and has a research portfolio focused on a range of innovations, such as:

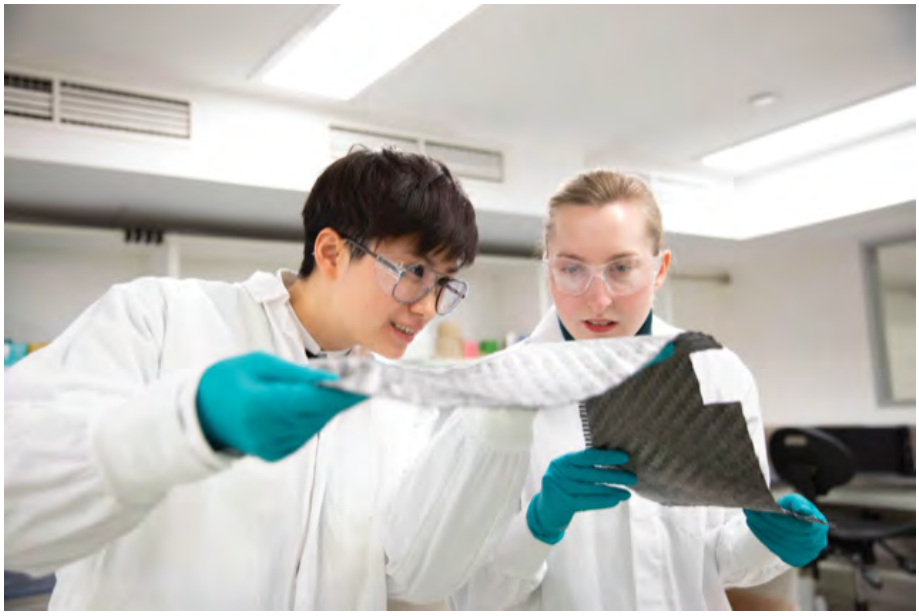
- Development of highly integrated, large-scale composite structures
- Advanced production systems and collaborative robotics for aerostructures manufacturing
- Autonomous systems and sensors to support the deployment of future unmanned systems
- Advanced virtual reality/extended reality technology for next generation remote training systems
- Low-cost, secure web systems for globally deployable remote test and collaboration
- Novel anti-microbial polymer coatings in support of Boeing's Confident Travel Initiative.

"BR&T-Australia not only supports Boeing's local businesses, it provides a focal point for collaboration with R&D organisations including universities, the government and private sector providers," says BR&T-Australia general manager Michael Edwards. "Most notably, Boeing has enjoyed a collaborative relationship with Australia's premier government research agency, the Commonwealth Scientific Industrial Research Organisation [CSIRO], for more than three decades."

DEFENCE PLATFORMS

With platforms including the E-7A Wedgetail, P-8A Poseidon, F/A-18F Super Hornet and EA-18G Growler, the Australian Defence Force (ADF) has some of the most capable surveillance, command, control and combat platforms in the world.

Australia was Boeing's launch customer for the E-7A Wedgetail.



Ten years later, the Wedgetail remains one of the world's most capable air battlespace management capabilities – most recently evidenced by its critical six-year role supporting allied forces in the Middle East.

"The RAAF leaned in to push the capabilities of the aircraft and, from initial development to upgrades undertaken through AIR 5077 Phase 5A, BDA [Boeing Defence Australia] has developed a reputation for being a world-leading defence mission systems and software technology developer," says BDA vice president and managing director Scott Carpendale.

BDA is also responsible for ongoing sustainment of the Wedgetail fleet along with the F/A-18 Classic Hornet, F/A-18F Super Hornet, EA-18G Growler, CH-47 Chinook, C-17 Globemaster, P-8A Poseidon and Helicopter Aircrew Training System. In all, the company supports mission-readiness for more than half the ADF's aircraft types.

The newest addition to Boeing's global defence portfolio, conceptualised and developed by Boeing Australia and manufactured in Australia, is the Boeing Airpower Teaming System (ATS) – dubbed Loyal Wingman by the RAAF. Conceived to create disruptive advantage for global defence customers, the ATS is designed to work as a smart human-machine team synchronised with existing military aircraft to complement and extend combat performance.

ABOVE Carbon fibre before resin infusion treatment.

OPPOSITE RAAF E-7A Wedgetail A30-003 from No.2 Squadron flies in formation with No.77 Squadron F/A-18A Hornets and a No.6 Squadron EA-18G Growler. Photo: SGT Guy Young.

In a recent address about the Loyal Wingman, Prime Minister Scott Morrison expressed pride in the ingenuity that has led Australia to design and manufacture its first military aircraft in more than 50 years. Unveiled at the Australian International Airshow at Avalon in February 2019, ATS has recently successfully completed its first high-speed taxi test in preparation for first flight in early 2021.

Boeing's Systems Analysis Laboratory (SAL) in Brisbane is the region's leading advanced concepts and military operations development and experimentation centre. With a team of software engineers and ex-military operations analysts, supported by Boeing's international laboratory network, SAL provides decision support services to defence projects.

COMMUNICATIONS HERITAGE

BDA was borne out of Rockwell Electronics, which manufactured communications equipment for the ADF. BDA's role supporting the development of communications systems for the Collins Class Submarine was key to it securing the ADF's High Frequency Communications Network Modernisation (now called the Defence High Frequency Communications System – DHFCS) and the Air Defence Command and Control System (now Wakulda) contracts in the late 1990s.

Marking its tenth year of service last year, the DHFCS is a uniquely Australian capability that provides state-of-the-art, long-range secure and non-secure tactical voice, data and email communications across the high-frequency (HF) band. DHFCS supports information exchange between fixed stations and air, land and sea platforms and is the only alternative when satellite communications are not available or have been disabled.

Wakulda is a core component of the RAAF's air defence surveillance network. It receives, interprets and consolidates data from more than 250 defence and civil radars and other sensors to generate and display the Australian Recognised Air Picture.

Those building blocks of Boeing's Australian communications capability have paved the way for next-generation systems, such as the Currawong battlespace communications system. A complex, modular, flexible deployed system, Currawong provides secure wideband voice, data and video services using line-of-sight radio, satellite, troposcatter, internet and HF radio to connect deployed forces and command centres.

ABOVE Project Currawong mobile satellite trailer..

BELOW LEFT DHFCS antenna farm.

PARTNERING TO DELIVER

"As a world-leader in aerospace, Boeing takes very seriously its responsibility to engage small-to-medium sized companies (SMEs) in the development of new capabilities, connecting them with Boeing's global supply chain and providing Australian industry with greater local and international export opportunities," says Scott Carpendale.

"SMEs and local defence industry are core to Boeing's ability to provide agile solutions to meet complex customer requirements. Fifty percent of Boeing's Australian supply chain are SMEs. We've spent more than $10 million with Indigenous-owned businesses since 2012 and remain focused on growing our Indigenous supply chain through partnerships with Supply Nation and the Indigenous Defence and Infrastructure Consortium."

To support its promotion of sovereign capability, the company established the Boeing Office of Australian Industry Capability (OAIC) in Seattle, Washington in 2007. Focused on matching Australian-developed technology with global partners, the OAIC has engaged hundreds of Australian companies since its inception and offers training and mentoring support in program management, business development, communications, specialised manufacturing and machining, quality assurance and lean manufacturing.

A BROAD PORTFOLIO

A number of other Boeing subsidiaries deliver critical services in the aerospace arena. Based in Brisbane, Insitu Pacific is a subsidiary of US-based Insitu Inc. which provides innovative unmanned systems to suit a variety of applications.

Insitu Pacific's ScanEagle was deployed in support of Australian troops in Afghanistan, where it flew more than 40,000 combat hours. It has also been used by Queensland Gas Company to inspect gas wells, pipelines and processing facilities within Queensland

in a first-of-its-kind program in Australia.

Insitu Pacific is continually exploring the application of unmanned aircraft systems for agriculture, mining, oil and gas, wildfire monitoring and marine mammal monitoring.

Through Aviall Australia and Boeing Distribution Services, Boeing Global Services provides leading supply-chain management solutions for new aviation parts and aftermarket services geared to commercial and defence customers.

THE FINAL FRONTIER

In 2019, Boeing signed a statement of strategic intent with the Australian Space Agency to help to grow Australia's space industry and the number of people working in it. Also, in 2019, Boeing and CSIRO announced a multi-year collaborative research agreement that included a number of jointly developed space-related technology developments.

Within its defence business, Boeing first delivered satellite-on-the-move capability on the RAAF's C-17A Globemaster III in 2015. It has since delivered Australian-integrated satellite communications terminals certified for use on the Wideband Global Satellite network under the Currawong battlespace communications system program.

Boeing Australia is also supporting the Commonwealth by developing new approaches to modelling and simulation including the construction of complex, multi-domain and joint force scenarios to understand the implications of a contested, degraded and operationally limited space environment.

VETERANS & THE COMMUNITY

Boeing's Australian story would not be complete without a mention of its commitment to supporting the communities in which it operates, and those who have served the nation. Veterans make up more than 20 percent of the employees at the company's two defence subsidiaries, Boeing Defence Australia and Insitu Pacific, and half of those veterans are managers.

"Our efforts to recruit, hire, develop and promote veterans is truly a part of our DNA," says Brendan Nelson. "Our team is proud that these efforts were formally recognised in 2018, when BDA received the inaugural Prime Minister's Veterans' Employment award for Veterans' Employer of the Year – Large Business."

Boeing's commitment to giving back includes grants to civic, environment, health, education and veterans' organisations, and engaging staff and matching financial donations to assist communities at times of need. Boeing Australia continues to make significant investments in local talent, technology, industry, innovation and communities.

Photo: Warrant Officer Ray Bennell

F-111C, **WINGS** VOLUME 73 NO.1

The General Dynamics F-111 was conceived as a multi-role fighter for both Navy and Air Force deployment. Ultimately, the aircraft was only ever fielded by the USAF and the RAAF in tactical interdiction and light strategic strike roles.

The F-111 was capable of 800KIAS/Mach 2.5 and exploited a hybrid flight control system linked to a radar sensor to terrain follow and penetrate airspace at low level (100 feet) in all weather, day or night. The aircraft could carry an array of ballistic and guided air-to-surface (A/S) weapons including the AGM-84 Harpoon anti-ship missile; the RAAF was the only service to envisage a maritime strike role for the F-111.

This photo of A8-132 was taken from a Mirage IIID while in transit to test fire an AGM-88 High Speed Anti-Radiation Missile (HARM). The F-111C was flown by SQNLDR Mark Skidmore (Skates) with FLTLT Mark Lax navigating and the Mirage IIID chase, A3-112, was flown by FLTLT John O'Halloran (JOH). The unique and striking photo was captured by WOFF Ray Bennell, a professional photographer assigned to ARDU, with a Hasselblad 2000FC single shot camera.

STEALTH FIGHTER

ORIGINS OF THE F-117

IN PART TWO OF OUR SERIES ON LOCKHEED'S SKUNK WORKS, WE LOOK AT THE DEVELOPMENT OF THE F-117 NIGHTHAWK, FLOWN BY THE US AIR FORCE FROM 1983 TO 2008.

ABOVE Phantom view of F-117A. Image: Denny Lombard, LMSW.

THE LEGENDARY SKUNK WORKS, Lockheed Advanced Development Projects facility founded by Clarence "Kelly" Johnson at Burbank (later Palmdale), California, originated in 1943 after Johnson's involvement with the P-38 Lightning fighter project. It has produced cutting-edge aircraft such as the P-80 Shooting Star, U-2 Dragon Lady, F-104 Starfighter, F-22 Raptor and F-35 Lightning II.

Skunk Works' triple-sonic aircraft – the CIA's single-seat A-12 and the US Air Force's SR-71 strategic reconnaissance aircraft – are probably its most famous product. But between 1983-2008 an altogether different but equally intriguing Skunk Works aircraft, the F-117 Nighthawk, served operationally with the USAF. The 'stealth fighter' (actually an attack aircraft), with its tiny 10cm equivalent radar signature, saw active service in the 1989 US invasion of Panama, the 1991 Gulf War and the 1999 NATO bombing of Yugoslavia.

The following is a summary of the development of the F-117, from its origins in the secret Have Blue project, through related projects to Senior Trend. Edited excerpts and photographs are used (with permission) from Chapter Four of *The Projects of Skunk Works: 75 years of Lockheed-Martin's Advanced Development Programs* by Steve Pace (Voyageur Press). US terminology has been retained, with metric conversions for Imperial measurements added, except for altitudes.

ABOVE Have Blue Experimental Survivable (read stealth) Testbed demonstrator number two (HB-1002) in Burbank just prior to being shipped to Area 51. Photo: LMSW.

HAVE BLUE XST

The Have Blue Experimental Survivable Testbed (XST) program began in November 1975 under a joint US Air Force (USAF) and Defense Advanced Research Projects Agency (DARPA) contract with Lockheed and its Skunk Works to build and fly two XST air vehicles.

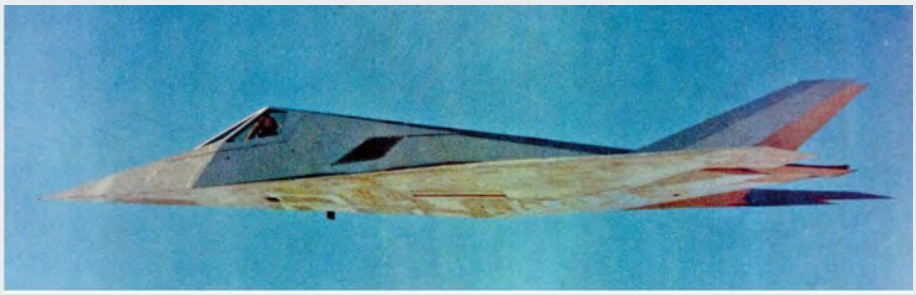
The Skunk Works designs were the inventions of Richard Scherrer, Denys

D. Overholser and Kenneth E. Watson. The unique engine exhaust system used on both Have Blue XST and the F-117 was designed by Stephen G. Justice. As a matter of interest, the competing Northrop entry featured triangular wings, a single vertical tail and rudder and no horizontal tail planes. Its propulsive system, most likely a pair of aft-mounted J85 engines, were to be fed air via a single dorsal inlet and duct system mounted just aft of the cockpit.

The two Have Blue XST air vehicles were assembled in Building 82 at Lockheed's Burbank, California, facility and given Lockheed factory serial numbers 1001 and 1002. They were then transferred to Area 51 (Groom Lake), Nevada for developmental flight test. Have Blue number one or HB-1, the aerodynamic testbed, was initially flown by Lockheed test pilot Bill Park on 1 December 1977. The second example, HB-2 was first flown on 20 July 1978 by USAF Lt. Col. Norman Kenneth "Ken" Dyson.

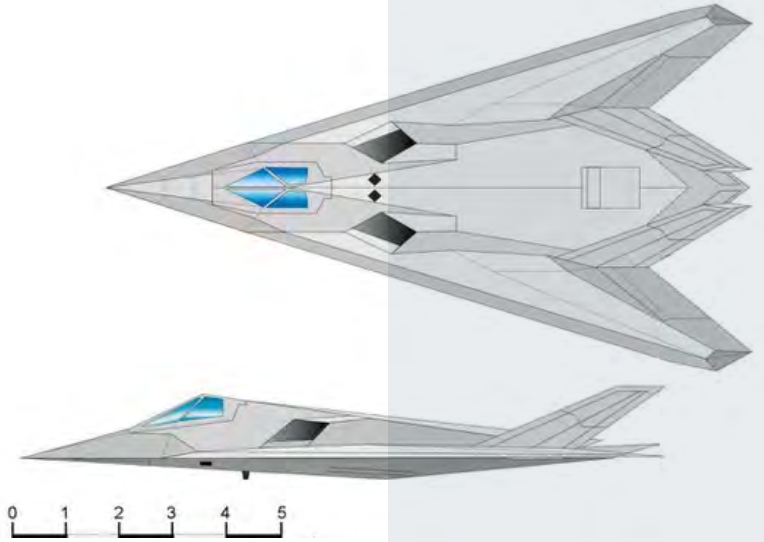
The highly classified Have Blue program ended in November 1978, when Lockheed got the go-ahead on the Senior Trend program. However, flight testing on HB-2 continued. Both air vehicles were lost in separate crashes: HB-1 on 4 May 1978, on its 36th test flight, and HB-2 on 11 July 1979, on its 52nd test flight. Both Park and Dyson survived and the remains of the aircraft were buried somewhere within Area 51.

The pair of Have Blue XST prototypes played a significant role in the creation and success of the F-117 stealth fighter. Although both were lost in crashes, the 88 test flights between them demonstrated that low-observable technologies could be applied to a functional combat aircraft, as proven by the performance of the F-117 Nighthawk on operations.



SENIOR PROM MISSILE

With the success of the two Have Blue XST air vehicles, especially their anti-radar characteristics, the Skunk Works offered a design of a stealthy cruise missile, loosely based on the configuration of its XST aircraft, for the Advanced Cruise Missile (ACM) competition. So promising was the offering that the USAF ordered an unknown quantity of those missiles under a highly classified program dubbed Senior Prom. The Senior Prom missiles were evaluated through a series of launches from a USAF C-130 Hercules. A special attachment point was installed under the outer left wing of the C-130, and the first launch was made in October 1978.



The results of that and subsequent flights are not known publicly, for the program remains classified and no further Senior Prom details are available. It is known, however, that no full-scale production orders for Senior Prom air vehicles were forthcoming and that it was the General Dynamics Corporation that produced the ACM that became known as the AGM-129A.

ABOVE Have Blue number two in flight with USAF Col. Ken Dyson at the controls. Photo: LMSW.

BELOW LEFT Have Blue XST demonstrator number one (HB-1001) in light grey livery. Artwork: Giuseppe De Chiara.

F-117A FIRST FLIGHTS AND PILOTS

SCORPION 1: (780) 18 June 1981, Harold C. "Hal" Farley Jr. (Bandit 117)

SCORPION 2: (781) 24 September 1981, David L. "Dave" Ferguson (Bandit 105)

SCORPION 3: (782) 18 December 1981, Thomas A. "Tom" Morgenfeld (Bandit 101)

SCORPION 4: (783) 7 June 1982 (flew after Scorpion 5), Tom Morgenfeld (Bandit 101)

SCORPION 5: (784) 10 April 1982, Robert L. "Bob" Riedenauer (Bandit 103)

SENIOR TREND: F-117A

The Lockheed F-117A Nighthawk was the first and, until the advent of the B-2 stealth bomber, only operational stealth airplane in the world. Although the existence of such a warplane had been rumoured for several years as the F-19, the existence of the F-117A wasn't made public until 10 November 1988, when Pentagon spokesman James Daniel "Dan" Howard announced the project at a press briefing.

Along with his announcement came release of a very poor-quality photograph of the F-117A that largely distorted its actual appearance. It didn't have an official name at the time, as it was only known as the Black Jet to those associated with it.

Developed and produced by the Skunk Works for Tactical Air Command USAF, the F-117A Nighthawk was classified as a strike fighter and designed from the outset to utilise very low observables (VLO), or stealth, technologies. Following the two XST aircraft under the Have Blue program, five full-scale development (FSD) F-117A aircraft were built under the Senior Trend program. Those aircraft were used in part for aerodynamic, stealth and airborne tactical warfare evaluations.

The five FSD F-117A airplanes ordered, Lockheed factory serial numbers 780 to 784, were later redesignated YF-117A to better describe their prototype status. Those five aircraft were called Scorpion 1 through Scorpion 5 by those closely associated with them and known collectively as the Baja Scorpions. When pilots made their first flight in an F-117A and/or other classified aircraft, they earned Bandit status and were assigned a Bandit number.

The first flight of a production F-117A (785) was attempted on 20 April 1982 from Area 51, with Skunk Works test pilot Bob Riedenauer at the controls. Unfortunately, its computerised fly-by-wire flight control system had somehow been connected up incorrectly and when Riedenauer rotated for take-off, the airplane immediately went out of control, flipped onto its back and crashed inverted. Riedenauer survived but was severely injured and would never fly again. That airplane therefore was not accepted by the USAF and wasn't counted in the total of 59 production F-117As built and delivered.

The second production F-117A (786) flew on 15 July 1982. The third (787) flew five days later and, on 23 August, became the first production example accepted by the USAF. Chief engineering test pilot Hal Farley made both of those first flights.

INTO SERVICE

As F-117A production increased, the fleet was assigned to a specially built air base in Nevada, complete with individual hangers for each airplane. The once top-secret facility is called Tonopah

TOP YF-117A number one (USAF serial number 79-10780) during assembly in Burbank. Photo: LMSW.

ABOVE Subscale RCS F-117 pole model. Photo: LMSW.

BEN RICH – PRESIDENT OF LOCKHEED ADVANCED PROGRAMS, 1975-91

Benjamin Robert "Ben" Rich joined the Lockheed Aircraft Corporation in 1950 as a thermodynamicist. At the request of Kelly Johnson, he joined the Skunk Works in mid-1953 to work on the design of engine air inlets for the experimental and prototype F-104s. On 17 January 1975, Vice President Ben Rich became the second president of the Skunk Works. In that capacity he pushed corporate management into the very low observables world and found great success in the Have Blue and Senior Trend programs, earning the title "Father of Stealth".

Rich was born on 18 June 1925 in Manila in the Philippines and passed away on 5 January 1995, aged 69.

Test Range (also known as Area 10) and is located about 70 miles (113km) northwest of Area 51, and some 30 miles (48km) southeast of Tonopah.

When the F-117A Nighthawk became operational in October 1983, Tactical Air Command USAF had a dedicated precision strike stealth aircraft that could carry and deliver two 2,000-pound laser-guided (later satellite-guided) Joint Direct Attack Munitions (J DAM) bombs and escape enemy territory without detection.

Aviation enthusiasts the world over were astonished at the aircraft's configuration. Expected to be of curvaceous and sleek design to achieve its anti-radar characteristics, it was instead angular and jutted. It looked more like a flying iron than an airplane. Moreover, since the F/A-18 Hornet and F-20 Tigershark had already flown (in 1978 and 1982 respectively), everybody assumed it would be designated F-19, so its designation F-117A was a perfect cover. After the F-111 there had been no subsequent century-numbered designations.

The F-117A Nighthawk was a very successful warfighter, flying combat missions over Panama, Iraq and Yugoslavia. Just one was shot down, a loss considered the result of a lucky shot from the ground. In July 1992, the 49th Fighter Wing at Holloman AFB, New Mexico, became the sole operator of the

ABOVE YF-117A number one being prepared for its first flight on 18 June 1981 at Area 51. Photo: LMSW.

F-117A. Prior to that it was operated by the 4450th Tactical Group (absorbed by the 37th Tactical Fighter Wing in October 1989) at Tonopah Test Range.

The F-117A was replaced by the F-22A Raptor at Holloman AFB. Ten were retired in December 2006, followed by 27 between January and March 2008. A retirement ceremony honouring the contributions made by the F-117A took place at Wright-Patterson AFB in Dayton, Ohio, on 11 March 2008. The last F-117As to fly into retirement left Holloman AFB on 21 April 2008, stopping in Palmdale, California, for another retirement ceremony, and arrived at their final destination on 22 April.

The remaining fleet of Nighthawks were earmarked for mothballing at their original home, Tonopah Test Range, after an operational life of less than 22 years. Its earlier-than-expected retirement was intended to save money for other programs, such as the F-35 Lightning II.

The F-117A program demonstrated that a stealth aircraft can be designed for reliability and maintainability. It revolutionised military warfare by incorporating VLO technologies into operational aircraft. Now replaced by the F-22A, a fifth-generation stealth airplane and the USAF's stealth fighter of choice, the F-117A has been overtaken by the stealth technologies it pioneered.

Weapon loading tests at Eglin AFB in Florida. Photo: Denny Lombard, LMSW.

F-117A SPECIFICATIONS

CREW: One (pilot)

PROPULSIVE SYSTEM: Two axial-flow, non-afterburning 10,600-lbf General Electric F404-GE-F1D2 turbofan engines

LENGTH: 65ft 11in (20.1m)

HEIGHT: 12ft 9.5in (3.9m)

WINGSPAN: 43ft 4in (13.21m)

EMPTY WEIGHT: 29,500 lbs (13,381kg)

GROSS WEIGHT: 52,500 lbs (23,814 kg)

MAXIMUM SPEED: Mach 0.92 or 617mph (993km/h)

MAXIMUM RAN GE: 1,070 miles (1,722km)

SERVICE CEILING: 45,000ft

PAYLOAD: Two 2,000 lb (907 kg) precision-guided bombs carried internally

ABOVE Lockheed Martin F-117A artwork for the USAF. Image: LM Code One.

RAAF'S LARGEST BASE

SINCE OPENING IN 1940, RAAF BASE AMBERLEY HAS DEVELOPED INTO A 'SUPER BASE' WITH AN INCREASINGLY DIVERSE DEFENCE ROLE.

RAAF BASE AMBERLEY, 50km west of Brisbane in South East Queensland, is the RAAF's largest operational base, established to sustain airpower capability for resident, forward-based and transiting ADF aircraft.

The need for a RAAF base in the Brisbane region was identified in the 1930s. The RAAF chose the Amberley site due to its flat, well-draining terrain, good visibility and proximity to engineering works and the Brisbane railway line. It acquired the land in December 1938 under the Defence purposes provision of the *Lands Acquisition Act 1906-1936*. Prior to European settlement, the site and surrounding area were home to the Yuggera and Ugarapul clans.

RAAF Base Amberley is orientated around a large runway complex and accommodates a range of aircraft and squadrons, Force Element Groups, Australian Army units, Defence organisations, the Australian Air Force Cadets No.208 Squadron, aerospace companies, retail outlets and the RAAF Amberley Aviation Heritage Centre.

The base covers more than 2,500 hectares and employs approximately 6,000 uniformed and civilian personnel.

The site includes adjacent farms (used for training exercises such as airdrops), an arms range and five buffer zones. In cooperation with the NSW National Parks and Wildlife Service, the base also manages the Evans Head Air Weapons Range in Northern NSW.

RAAF Base Amberley provides permanent facilities for five military aircraft platforms: F/A-18F Super Hornet, EA-18G Growler, C-17A Globemaster III, KC-30A Multi-Role Tanker Transport and C-27J Spartan.

Aerial view of RAAF Base Amberley circa 1940s.

RAAF Base Amberley flight line and hard stand. Photo: FSGT Glen McCarthy.

EARLY DAYS

Construction of the runway and base infrastructure began in 1939 and was one of the largest building projects undertaken in Queensland at the time.

The first building completed was the Commanding Officer's headquarters, designed in the British Colonial style. Base facilities, including hangars and accommodation, were added in quick succession and RAAF Base Amberley officially opened in June 1940.

The first aircraft stationed at Amberley was the Moth Minor No.A21-26, followed shortly by four CAC Wirraway aircraft. By the end of 1940, there were 54 aircraft based at Amberley and over the next two years the base was transformed into a centre of excellence for the assembly, maintenance and salvage of aircraft, including for the United States Army Air Force, as Amberley was its primary staging post during World War II.

In March 1941, the Women's Auxiliary Australian Air Force was formed, leading to the employment of women on the base in a variety of roles, including radar operators, wireless telegraphy operators, parachute packers, instrument repairers and drivers.

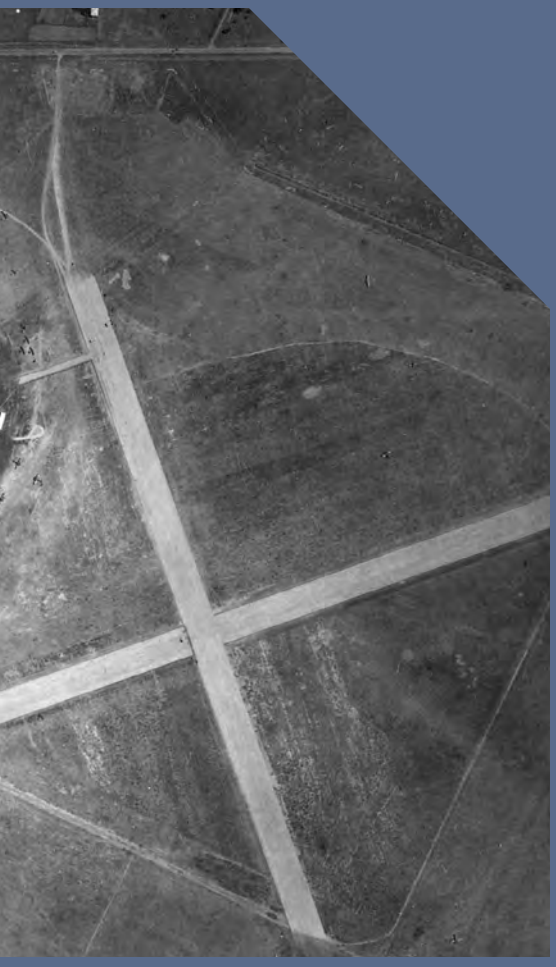
The following year a dummy airfield, complete with empty hangars and decommissioned aircraft, was constructed to thwart potential enemy attacks.

During 1942 and 1943, Amberley accommodated various USAAF units and hundreds of US military personnel were stationed there.

By the end of the war in 1945, the base had accommodated the Lockheed Hudson, Martin B-26 Marauder, Curtiss P-40 Warhawk (Kittyhawk), Vultee A-31 Vengeance, Bell P-39 Airacobra, Republic P-43 Lancer, Douglas A-20 Havoc (Boston Bomber), Supermarine Spitfire and Consolidated B-24J Liberator.

BELOW A parade at RAAF Base Amberley circa 1965.

BOTTOM A GAF Canberra Bomber observed from the tower at RAAF Base Amberley.



The arrival of the F-111 circa June 1973.

POST-WAR YEARS

The site became a major RAAF bomber base following the war, with Lincoln bombers initially based at the site, followed by the Canberra.

Tragically, an Avro Lincoln crashed in the northeast corner of the base in 1948, killing all 16 personnel on board.

The first bomber in RAAF service to be fitted with ejection seats, the GAF Canberra Mk 20, arrived at the base in 1953, remaining in service first as a bomber and then in target towing and photo reconnaissance roles until 1982.

Also, during 1953, base personnel hand-dug a swimming pool in their free time, finishing just in time for summer.

A major realignment of the main runways was undertaken and Wirraway, Vampire and Meteor aircraft were stationed on-site during the 1950s.

In 1960, No.16 Army Light Aircraft Squadron formed at RAAF Base Amberley as a joint unit operating Bell Sioux helicopters and Cessna 180 light aircraft. In 1966, the Squadron expanded and was renamed 1st Aviation Regiment.

The period between 1962 and 1970 saw construction of a new air traffic control tower and several new hangars. The largest, Hangar 363, was later assigned to General Dynamics F-111C aircraft operated by No.1 Squadron.

In 1970, the RAAF retired the Canberra bomber from operational service and the government leased 24 McDonnell Douglas F-4 Phantom II aircraft from the US Government, prior to the arrival of the F-111C. Sadly, one of the Phantoms was lost at sea with both crew members during an exercise at the Evans Head Air Weapons Range in 1971.

An extension of the main runway to more safely accommodate the future F-111C was completed in 1971 and the first six F-111C aircraft arrived at the base in 1973. A few months later No.12 Squadron was formed with CH-47 Chinook helicopters.

The transfer of the battlefield helicopters – Bell UH-1 Iroquois, Sikorsky UH-60 Black Hawk and CH-47 Chinook – from the RAAF to the Army in 1989 provided the opportunity for additional aircraft capability on the base and three years later, 10 de Havilland Canada DHC-4 Caribou aircraft were relocated to Amberley.

The 1990s saw the parade ground, the heart of the base since the 1940s, converted to a car park, and a new entrance gate installed, complete with a memorial garden and a static Canberra Bomber. A84-201 was the first Australian built GAF Canberra and also came second in the 1953 London to Christchurch Air Race.

DEVELOPING A SUPER BASE

In 2000, redevelopment works commenced with the relocation of Combat Support Group (CSG) from Glenbrook, NSW, and new headquarters for No.82 Wing, while the base also hosted several operational combat support units and security and fire training capabilities.

Development of the 'super base' continued over the subsequent years, including the construction and refurbishment of accommodation, airfield upgrades, combined mess, gym, military working dog facilities, security and fire training and the Headquarters CSG building.

In 2006, No.36 Squadron relocated to RAAF Base Amberley when it commenced re-equipping with the C-17A Globemaster III strategic airlifter.

In 2010, after 37 years of service, the F-111, known as 'the pig', was retired, with two remaining on display, one at the main entrance to the base and the other moved to the RAAF Amberley Aviation Heritage Centre which opened in 2011 (see page 48 for more).

No.33 Squadron relocated to the base in 2008 and in 2011 began re-equipping with the KC-30A Multi-Role Tanker Transport.

Throughout its life, RAAF Base Amberley has hosted elements of the Australian Army. From 1960 to 1973, it was home to Army Aviation and since 2006 has supported a variety of Army and joint force units. In 2015, the Joint Logistics Facility was opened on a 22-hectare site in the centre of the base.

BELOW A CH-47 Chinook heavy-lift helicopter over RAAF Base Amberley.

A C-17A Globemaster III departs the base with humanitarian aid bound for Fiji. Photo: CPL Nicci Freeman

THE BASE TODAY

RAAF Base Amberley is home to a number of Force Element Groups (FEGs). RAAF's largest FEG with more than 5,600 permanent and reserve personnel, Combat Support Group (CSG) is headquartered at the base, along with: Combat Support Division, Headquarters 96 Wing, No.23 (City of Brisbane) Squadron, Headquarters 95 Wing, No.382 Squadron, No.295 Squadron, No.1 Combat Communications Squadron (Amberley Detachment), No.2 Security Forces Squadron Headquarters, Health Services Wing, No.1 Expeditionary Health Squadron Headquarters, No.3 Aero-medical Evacuation Squadron (Amberley Detachment) and Health Operational Conversion Unit.

A detachment of Headquarters Air Combat Group (ACG) personnel is co-located at Amberley with Headquarters No.82 Wing, along with ACG's No.1, No.6 and No.278 Squadrons.

Although Headquarters Air Mobility

Group (AMG) is located at RAAF Base Richmond, NSW, RAAF Base Amberley hosts a number of subordinate units: Headquarters No.86 Wing and No.33, No.35 and No.36 Squadrons. The base is also home to three of the six aircraft types flown by AMG – the KC-30A, the C-27J and the C-17A.

No.452 Squadron Amberley Flight (part of Surveillance and Response Group) provides Air Base Air Traffic Services and airspace management in support of flying operations and training at the base, including managing more than 30,000 aircraft movements a year. Air traffic controllers simultaneously manage civilian aircraft transiting the Amberley airspace to/from Brisbane, Archerfield, Toowoomba, Wellcamp and upwards of 40 other civilian airfields in South East Queensland and Northern NSW. The Ground Electronic Services section maintains the air traffic control radar, communication equipment and a number of vital navigation aids.

Two Air Force Training Group schools are located at the base: RAAF Security and Fire School and School of Postgraduate Studies – Professional Military Education Flight. RAAF Amberely also houses a range of Defence organisations which support ADF operations, including Joint Logistics Unit South East Queensland, Estate & Infrastructure Group, Heavy Air Lift Systems Program Office, Air Combat Electronic Attack System Program Office, Aerospace Explosive Ordnance System Program Office and Defence Aviation Safety Authority.

RAAF Base Amberley also supports Army units from 9th Force Support Battalion, 6th Engineer Support Regiment and LAND 121.

A F-111 'dump and burn'.

F/A-18F Super Hornet taxis for take-off. Photo: LAC Jesse Kane.

PERMANENT AIRCRAFT AT RAAF BASE AMBERLEY

F/A-18F SUPER HORNET

No.1 Squadron operates RAAF's 24 Super Hornets. The twin-seat Super Hornet is larger than the F/A-18A (single-seat) and F/A-18B (twin-seat) Hornets. It can undertake air interception, air combat, air support of ground troops and interception of enemy supply lines. The Super Hornet will maintain Australia's air combat capability until the RAAF fully incorporates the F-35A Lightning II.

EA-18G GROWLER

No.6 Squadron operates 11 EA-18G Growlers. An electronic attack aircraft, the Growler is capable of disrupting, deceiving or denying a broad range of military electronic systems, including radars and communications. Based on the F/A-18F Super Hornet airframe, the Growler is fitted with additional avionics, enhanced radio-frequency receivers and radio-frequency jamming pods to jam enemy systems. The Growler supports a wide range of ADF tasks, from peacetime evacuations to major conflicts. It provides a complementary capability to the Super Hornet and F-35A Lightning II.

C-17A GLOBEMASTER III

No.36 Squadron operates eight C-17A Globemaster IIIs. The Globemaster can carry up to 77 tonnes of cargo and drop it while in flight. In its vehicle transport role, it can carry four Bushmaster Protected Mobility Vehicles or three Sikorsky UH-60 Black Hawk helicopters or one M1 Abrams tank. It can also be converted into a mobile hospital for aeromedical evacuations. The Globemaster can operate from unsurfaced runways as short as one kilometre, enabling Australia to deploy troops, supplies and vehicles anywhere in the world.

KC-30A MULTI-ROLE TANKER TRANSPORT

No.33 Squadron operates six KC-30A Multi-Role Tanker Transports – a heavily modified Airbus A330 airliner, featuring advanced communication and navigation systems and a self-protection system to shield itself from surface-to-air missiles.
In its transport role, the KC-30A can carry 270 passengers plus 34 tonnes of cargo.
In its air-to-air refuelling role, it can remain 1,800km from base for up to four hours and offload 50 tonnes of fuel. Compatible aircraft include EA-18G Growler, F/A-18A/B Hornet, F/A-18F Super Hornet, E-7A Wedgetail, C-17A Globemaster III, P-8A Poseidon, F-35A Lightning II and another KC-30A. The KC-30A can also refuel foreign aircraft such as the General Dynamics F-16C Fighting Falcon and Rockwell B-1 Lancer.

C-27J SPARTAN

No.35 Squadron operates 10 C-27J Spartans, which bridge the gap between Australian Army helicopters such as the CH-47 Chinook and larger RAAF aircraft such as the C-130J Hercules and C-17A Globemaster III. The Spartan can transport cargo and passengers, airdrop cargo and paratroopers inflight and conduct aeromedical evacuations.
It can operate from unsurfaced airstrips to support humanitarian aid and disaster relief missions in remote locations and has played crucial roles in bushfire assistance.

PRESERVING AMBERLEY'S HERITAGE

RUN BY RESERVISTS AND VOLUNTEERS, THE RAAF AMBERLEY AVIATION HERITAGE CENTRE SHINES A LIGHT ON THE HISTORY OF AVIATION IN SOUTH EAST QUEENSLAND.

THE RAAF AMBERLEY Aviation Heritage Centre was opened in June 2011 to showcase the history of the RAAF and the role of RAAF Base Amberley in providing air power to the nation.

The centre displays a growing range of static historical aircraft, including a World War II Boston Bomber (courtesy of the Papua New Guinea Government), a Vietnam-era Canberra bomber, Caribou, Douglas DC-3 and Lockheed Electra L-10 transport aircraft, a Sopwith Camel replica, Boomerang and replica Spitfire fighters, Sabre and F-111 jets, Winjeel, Pilatus Porter, Sioux, Iroquois and Blackhawk helicopters.

Occupying four Bellman Hangars, which were part of a group of 14 identical hangars built in 1942, the centre endeavours to add to the collection as more aircraft and artefacts are restored, loaned or donated to illustrate the breadth of military aviation in South East Queensland.

Visitors can see up close the F-111 crew module that could be ejected from the fighter/bomber during an in-flight emergency.

There are two aircraft refuelling tankers and a range of historic vehicles, including two World War II jeeps, on display.

A special display highlights the history of Australian Hospital Ship *Centaur* which was attacked and sunk by a Japanese submarine off the coast of Queensland on 14 May 1943. Of the 332 medical personnel and civilian crew aboard, 268 were killed. Survivors were discovered by the crew of an Avon Anson from 71 (CAF) Squadron that launched from the airfield at Lowood, 31km north of Ipswich.

Planning is underway for a display recognising the contribution of women in the defence of Australia. With the assistance of retired and current female members of the WRAAF and RAAF, the centre is collecting significant stories, memorabilia and objects for permanent display.

The Aviation Heritage Centre is run by a team of Air Force Reservists supported by dedicated volunteers from the Ipswich and Brisbane communities, all with a keen interest in military aviation history. Members of the team are usually on hand to explain each display and relate the story behind it with the hope those stories will be passed on from generation to generation.

Admission to the Aviation Heritage Centre is free, however, donations are gratefully accepted. As the centre is located inside the secure zone of RAAF Base Amberley, access is tightly controlled.

Visit the RAAF Amberley Aviation Heritage Centre website (raafamberleyheritage.gov.au) for opening hours and call 1800 623 306 or email RAAF.AAHC@defence.gov.au to confirm visit details.

THE FASTEST AUSSIE ON EARTH

IN 1987, **NEIL SMITH**, THEN OC NO.481 WING, RAAF BASE WILLIAMTOWN, RECEIVED AN UNUSUAL REQUEST FROM A YOUNG WESTERN AUSTRALIAN SET ON BREAKING THE WORLD LAND SPEED RECORD.

THIS IS NOT A STORY that would normally appear in an aviation magazine, but it is about ultra 'low flying' – at zero feet – and has a strong RAAF connection. It's the yet unfinished story of a dinkum Aussie bloke with a dream, unbridled determination and an irrepressible spirit, who, some 25 years ago, embarked on his journey to break the world land speed record.

"There's a Mr McGlashan at the front gate asking to see you sir," said my PA. It was 1987, in the days when OCs had PAs. "He says he would like to talk to you about mounting a Mirage engine into a car," she added.

Clearly a nut case, I thought, but the name rang a distant bell and, with the possibility the visit may provide some temporary relief from the insatiable in-tray, I agreed to see him. Fifteen minutes later a shortish, stocky bloke darkened the doorway to my office, introduced himself as Rosco and got down to business.

He announced that he had recently purchased four Atar 9C engines, ex-Mirage III, at a Defence disposals auction at St Marys (west of Sydney), and was planning to use one to break the world land speed record. His determination and enthusiasm were immediately apparent, and there was something about the bloke that told me he was fair dinkum.

I also had a reasonable idea of what it was like to strap oneself to an Atar 9C, albeit in a Mirage IIIO, and of the engineering challenges involved. So, after he produced drawings of the car and explained his plan of approach, Rosco had captured my interest and, moreover, my support. Simply put, I was hooked.

As an aside, some years later Rosco

Aussie Invader II with main drag chute deployed on the runway at RAAF Base Pearce.

BELOW Tubular steel frame nearing completion, with the Atar installed (except for starter).

BELOW RIGHT The Atar 9C assembled with all its 'optional extras'.

revealed to me how he came to buy four engines rather than one or two. It seems that, after receiving very short notice of the auction, he caught the redeye flight from Perth to Sydney to attend in person (see page 53 for the story in his own words).

BUILDING AN OPERABLE ENGINE

The immediate problem Rosco needed to solve was that his recent acquisitions were only 'core' engines: he needed to acquire the 'optional extras' such as an afterburner, fuel control units, starter, etc, to make them run. The other problem was that he was not particularly flush with funds. To say he was attempting a world record on a shoestring would be an understatement. Rosco and his wonderful, supportive (some would say long-suffering) wife, Cheryl, were living pretty frugally and pouring all their spare cash into his dream.

In 1987, No.3 Squadron was already operating the F/A18 Hornet at Williamtown and No.77 Squadron was re-equipping with them. With the simultaneous winddown of Mirage operations, Defence was starting to dispose of the aircraft and spares (hence the disposal of four engines at an affordable price). I suspected a number of repairable items would also be available, so I volunteered to enquire of a well-placed contact in the Equipo world whether Rosco would be able to buy the required items at disposal prices.

Acquisition of the 'extras' proved not as simple as first thought. There were people in Canberra who felt it would be irresponsible for Defence to sell Rosco the parts (at any price) because of the risk of "damage" he might do to himself. However, we were able to persuade them that he was well aware

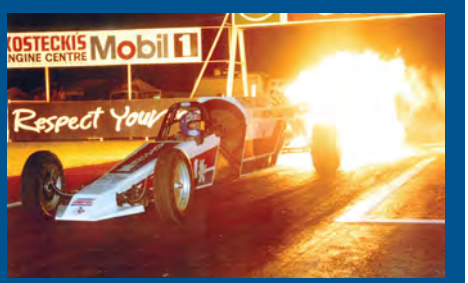
AUSSIE INVADER I

Aussie Invader I was a J34 Westinghouse jet powered dragster. It and a sister car were owned by the legendary Ken Warby MBE who set the world water speed record at 317 mph at Blowering Dam in NSW. Rosco helped Ken build the cars with a Chicago-based race-car builder, and then purchased Aussie Invader I after it had raced in the US, Australia and NZ. Rosco and Ken ran both cars side by side and performed at many race meeting and displays.

In Australia, the J34 augmented the take-off power of the Lockeed Neptune, producing around 3,400 lbs thrust. The J34 had no afterburner but Rosco and Ken designed their own using just 304 SS rolled sheet with their own design two-stage burner rings and flame holders. A hole was drilled into a combustion chamber to accommodate a hot streak to light the burner. The cars had two separate throttles, one for the engine, the other for the burner and a third lever for the main braking chute, with all three levers in a cluster gripped in the right hand. The left hand steered the car.

"By introducing an afterburner, over-speeding the engine way higher than military specs, increasing the engines fuel flow, adding water-methanol injection into the intake and squeezing our tailpipe diameter we made over 5,100 lbf," says Rosco. "Those engines had stallite turbine blades and always hot started with our EGT gauges on KILL. Thousands of starts, lots of FOD ingestions and running them on straight gasoline, diesel , JP1 or whatever fuel was available at our race venues. Aussie Invader I's best ET was 5.9 seconds at 242mph (390kph).

"That fantastic car did TV commercials, set the Tasmanian land speed record at 504kph, and travelled at over 500kph filming for a British Vauxhall commercial on a remote salt lake in WA."



Aussie Invader II on the Lake Gairdner salt for the first time.

of the risks. There was also a precedent. Rosco was already using a surplus J34 jet engine from a Neptune P2V7 in his Aussie Invader I, which he was using to delight the petrol heads attending drag meetings across Australia (see Aussie Invader I story on the left).

Having acquired the necessary items, the problem was how to fit them to an engine and run it. The engine shop at No.481 Wing was still servicing Mirage engines, but the number requiring maintenance was declining, providing some spare workshop capacity. Accordingly, the engine shop assembled and test-ran one of Rosco's engines at Williamtown. We were then able to find space on a Hercules going to Perth, so we waived Rosco (and the engine) goodbye with our best wishes. I recall thinking at the time that it would be the last I would see or hear of Rosco unless he either achieved his goal or spectacularly failed. How wrong one can be.

Fast-forward to 1992, when I arrived at RAAF Base Pearce as the newly appointed OC Base. On the initial tour of my 'kingdom', I was somewhat surprised to find, in one of the hangers, a vehicle that closely resembled Rosco's drawings from five years back. I guess I shouldn't have been surprised. It seemed I was not the only person who had fallen under the influence of Rosco's magnetic personality and powers of persuasion.

BUILDING AUSSIE INVADER II

In the years between 1987 and 1992, Rosco had been busy recruiting a large number of supporters and expert volunteers, including some RAAF fitters and technicians, who worked with him to build his dream car. Most of those people became firm friends of Rosco and Cheryl, and long-term members of his team.

Construction of Aussie Invader II commenced in 1988 using chrome molybdenum steel tube to create a frame 8m long by 2.2m wide to house the Atar engine, four wheels, a small Rosco-sized cockpit on the starboard side, and two brake chutes in the rear, all enclosed in a fibreglass shell. By 1992, the build was all but complete and Rosco had commenced test runs (on pneumatic tyres) on the Pearce runway after flying finished on Friday afternoons. The car ran straight and true and reached speeds of 300kph (about lift-off speed for the Mirage).

GETTING TO THE SALT

Aussie Invader II was now ready for the record attempt. Location was an issue. Several salt lakes in WA were considered but none could provide the runway length required. Finally, Lake Gairdner in South Australia was selected, a vast salt lake north of the Eyre Peninsular about mid-way between Port Augusta and Ceduna.

The next challenge was funding, which could only come by finding more sponsors. The logistics of getting Aussie Invader II and its support team to such a remote location and operating there for up to two weeks were significant, especially with the size of the support group Rosco wanted to take. He was keen to share the event with all the Aussie Invader people who had helped get him that far: crew, wives, sponsors – 40-odd people all up. While a smaller crew would have sufficed, that's just not Rosco's way; he never fails to show his appreciation.

LEFT Aussie Invader I.

Finally, in December 1993, everything was ready for the big event. Aussie Invader II was rolled from its transporter onto Lake Gairdner. While the logistic issues had been solved earlier, the December date reflected the local knowledge of weather conditions.

However, Rosco's problems were not over. There were to be many more obstacles and setbacks to follow.

To be continued next edition.

Neil Smith, MD RAAFA Publications, with the assistance of Peter Taylor, ex-FSGT engine fitter RAAF and Australian Land Speed Challenge team member.

AUSSIE INVADER II SPECIFICATIONS

DIMENSIONS: length 8m, width 2.2m, height 2.3m

WEIGHT: 4.5 tonnes

ENGINE: Atar 09C5 axial flow turbo jet (ex-Mirage III)

BODY: Welded tubular steel frame, fibreglass body

AXLES: Chrome molybdenum steel, grease specially developed by Kluber Lubrication, Germany

WHEELS: Forged aluminium alloy, no tyres

BRAKING: Two parachutes plus carbon fibre disc brakes on all wheels

FUEL CAPACITY: 500 litres (two minutes at full power)

PURCHASE OF THE FOUR ATARS

AS TOLD BY ROSCO MCGLASHAN OAM

Catching a redeye to Sydney, I was present at the most exciting aero auction I had ever attended. There was some really neat surplus parts there. I would have bid on everything but did not have $100 to my name. However, I was determined I was coming home with an engine.

Luckily the four engines were the last items on the list, all with their own auction ID numbers. It was an extremely hot day and took about four hours to reach the first engine, all four displayed with their transport container lids open. The auctioneer was being pushed round on a wheeled platform and there was lots of interest in the engines with bidders climbing all over them and leaving me feeling very discouraged.

Bidding started on the first engine and from memory went to $3,500 quite quickly, but then stalled.

The auctioneer announced: "The containers around these engines are worth more than $3,500. It's too hot. It's too late in the day. Pass them in." He instructed the guy pushing him to go in the direction of his office.

It took a few seconds for the penny to drop, but I then yelled back at the auctioneer: "Mate I got on a flight from Perth last night specifically to bid on one of these engines. If you're not happy with the offer on your first one, you can't drop all four separate listings".

"Which one do you want to bid on?" he asked.

"Number two in line," I responded.

"What is your bid?" he asked.

"$500, sir."

"Sold! What about the next one?"

"$500," I responded. "Sold… What about the next?" "$500." "Sold!" "What about the first one?" "$500." "Sold!"

Everyone present, including me, was gobsmacked. It was an amazing moment. I was in shock when I rang Cheryl and told her our exciting news. She was too but said. "Where are we going to find $2,000?". Somehow she did.

THE BIRTH OF A NUMBER

EIGHTY YEARS AGO, NO.450 SQUADRON FORMED AT RAAF WILLIAMTOWN.

UNDER THE AGREEMENTS of the Empire Air Training Scheme, Australia was responsible for the formation of a number of squadrons to be administered by the RAF, apart from the Australian squadrons already formed and active, such as No.3 and No.10 Squadrons.

On 7 February 1941, a number of serving RAAF men reported to the Commanding Officer (CO) of a secret Embarkation Depot (ED) at Williamtown, NSW with slips of paper declaring them to be members of No.450 Squadron awaiting posting. Simultaneously, at Bankstown, west of Sydney, No.451 Squadron began to take shape.

Those squadrons were the first established under 'Article XV' of the Empire Air Training Scheme and consisted, almost exclusively, of ground staff.

RAAF Base Williamtown was established on 15 February 1941 and its first squadron, No. 450, was formed the following day. By 25 March, the ED at Williamtown housed 267 enlisted men and seven officers. On 8 April, after spending countless hours training and preparing the grounds of the RAAF Base, CO designate SQNLDR John Paget named 450 Squadron Avenue on the base in honour of the squadron.

The following day, the squadron left Williamtown with nothing but personal kit and the mixed feelings of "Sailing Day" and boarded a train at Civic Station, Newcastle, bound for Sydney. Following a short truck ride and a ferry across the harbour to *HMS Queen Elizabeth*, which was officially referred to only as HMT PP. Six thousand men were aboard. Across the harbour, her sister 'ship', *HMS Queen Mary*, lay at anchor. Dwarfed were *Mauretania*, *Isle De France* and *New Amsterdam*. The convoy followed HMAS *Australia* out of the heads at 6.30am on 11 April 1941 to a destination unknown to its passengers. It was the largest convoy Australia had ever farewelled.

After disembarking in Egypt, initially at Port Tewfik on 5 May, then a short stay at Geneifa, the squadron was posted to Abu Sueir followed by Aqir, Palestine. There, in June, it united with the pilots and Hawker Hurricanes of No.260 Squadron, RAF, to form an operational squadron predominantly flying ground-attack operations during the Syrian campaign.

In August, No.260 Squadron's ground staff arrived from Britain and No.450 Squadron regained its original identity and purpose. After working as an Operational Training Unit in Rayak, Lebanon, and an Aircraft Repair Unit in Burg el Arab, Egypt, it moved to Kassassin, Egypt and reformed as a fighter squadron, receiving P-40 Kittyhawks and RAAF pilots in December.

On 20 February 1942, 450 Squadron commenced operations at Gambut, Libya. Initially designated a fighter squadron, its principal role was bomber escort and ground-attack in close support of land forces. That role required the squadron to be highly mobile, particularly in North Africa, as it would leap-frog detachments from one forward landing ground to the next to keep pace with the fighting on the ground.

No.450 Squadron, nicknamed the Desert Harassers, became one of the most famous RAAF squadrons of WWII. Its nickname was derived from the taunts of German-based propaganda broadcaster Lord Haw Haw who branded it "a band of Australian mercenaries whose harassing tactics were easily beaten off by the Luftwaffe". Needless to say, he was wrong.

On 9 April 1945, the Allies launched their last offensive in Italy, resulting in the surrender of German forces on 2 May. That ended No.450 Squadron's war, just as it was preparing to re-equip with the North-American P-51 Mustang.

The squadron was disbanded at Lavariano, Italy on 20 August 1945.

More than 800 airmen from five Commonwealth countries served in No.450 Squadron from 1941 to 1945, 61 airmen, both ground staff and pilots, did not return.

The '450 Club' was formed in Italy in November 1943, with view to maintaining friendships post war. Today, the surviving veterans and their children

retain that time-honoured tradition through the 450 Squadron RAAF Association Inc.

To commemorate the 80th anniversary of No.450 Squadron's formation, the Association unveiled a photographic exhibition at Fighter World, Williamtown on 15 February 2021.

A wreath was laid at the 450 Squadron Memorial, RAAF Base Williamtown on 15 February 21 by AIRCDR Tim Alsop, Commander Air Combat Group and WOFF Philip Martin on behalf of the Association.

Members and friends of the Association will commemorate the squadron's deployment to the Middle East with a formal dinner, commemorative service and events on 9-11 April.

An edited extract from the Squadron's Unofficial Diary - Vol 1 as recorded by the Pilots of No 450 Squadron (1942)

LEFT
RAAF Base Williamtown, March 1941.
Photo: courtesy Christie family.

ABOVE RIGHT Sightseers watch *Queen Elizabeth* (refitted as a troop transport) resting at anchor in Sydney Harbour, circa April 1941.
Photo: courtesty Archbold family.

RIGHT 450 Squadron airmen wave to the camera on the *Queen Elizabeth* foredeck in Sydney Harbour on 10 April 1941, the day before they sailed.
Photo: courtesy Gordon House.

CAMPAIGNS/OPS

Jun-Jul 1941 – Syria

Feb 1942-Mar 1943 – Western Desert (Egypt and Libya)

Mar-May 1943 – Tunisia

Jul-Sept 1943 – Malta/Sicily

Sep 1943-May 1945 – Italy

21 Mar 1945 – Operation Bowler, 450's last big operation.

THE PROPELLER ERA

CONTINUING THE STORY OF QANTAS' FIRST 100 YEARS, THE AIRLINE COMES OF AGE.

IN THE FIRST OF THIS FOUR-PART SERIES, 'Forming:1919-1923', we reflected on the events, motivation and persistence of a handful of people that brought about the formation of the Queensland and Northern Territory Aerial Services (QANTAS). By 1922, the company had secured its first mail contract and with a fleet of four biplanes was realising its creators' dream of bringing a better, safer and more connected lifeline to those who called the outback their home.

Before the end of that decade, the company would outgrow the Queensland and Northern Territory scope in its name, launching international services that eventually stretched to England and beyond. Over the propeller-powered decades that followed, Qantas expanded its horizons, ultimately encircling the globe.

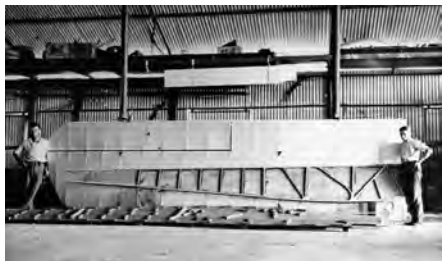
It was a period of great change for the company, the country and the world. For Qantas, it was an era of newer technologies, larger aircraft, new opportunities and great setbacks. But the greatest change for the airline was its business evolution. No longer a bush service of biplanes linking country railheads and serving small rural communities, it became a modern transport giant connecting Australia to the global economy and establishing a travel industry.

RIGHT
A DH50 fuselage taking shape in the Longreach hangar.

BELOW RIGHT Another DH50 wing completed.

QANTAS' first de Havilland DH50A in 1928 – G-AUER.

BELOW QANTAS newspaper ad, 1925.



NORMING: 1923-1959

With the first airmail service from Charleville to Cloncurry completed and the unfortunate departure of the airline's co-founder Paul McGinness, Hudson Fysh, now head of operations, was responsible for settling the business into a profitable, safe and routine operation. Keeping both Armstrong Whitworths, the Avro and the BE2e in the air fell to engineer Arthur Baird. Rough landing grounds, new pilots learning the ropes, a regular airmail service and ad-hoc charters made for some bumps in the operation. In its first 10 years, Qantas clocked up, what was for the time, quite an enviable safety record. Covering over one million miles there were only about 35 accidents (mostly minor) and 80 odd forced landings, the majority due to engine problems. Those events kept Baird busy repairing aircraft damage and replacing failed engines, sometimes in the most inhospitable of locations and conditions. A brilliant innovator, Baird spent his spare time finding ways to augment the fleet's performance to better cope with the blistering summer heat.

In bidding for the airmail service, the board members had pinned their hopes on the largely untested Vickers Vulcan, but the Vulcan's performance proved to be woefully inadequate in the western Queensland environment. In the relative cool of a March morning in 1923, four Qantas board members, Chairman Fergus McMaster, Templeton, Michod and Fysh climbed into the Vulcan's cabin for a demonstration flight. Eventually airborne, the single Rolls Royce Eagle VIII engine struggled to keep the aircraft aloft. The manufacturer's promise of climbing to 10,000 feet in 13 minutes was never going to be realised, so the Vulcan order was rejected. In the end a settlement was reached with Vickers in the sum of £1,000 in damages to Qantas, but there remained the problem of finding an appropriate addition to the fleet. The board reconsidered the available options and eventually approved the purchase of two DH9C aircraft, but they would not arrive for some time. And so, Fysh and Baird continued the juggling act of scheduled maintenance and damage repairs with dogged persistence.

In its first three years, Qantas successfully completed virtually every mail service, yet the operation could not turn a profit. But by the end of 1924, with the DH9Cs finally on-line, Fysh was able to report to the board a profit for the year of just over £1,200, the approximate cost of one of the recently acquired DH9C aircraft. Public confidence in the local air service was also growing. The news that pregnant Mrs Armstrong had been urgently flown to the base hospital to safely deliver her baby was the talk of the town. When a local flood left 36 shearers stranded on one side of the Thomson River and a pub dangerously low on liquid stocks on the other, the sight of QANTAS ferrying men in one direction and beer and rum in the other was enough to silence even the loudest critic.

For QANTAS, the greatest battle remained sourcing the right aircraft to support the business. By late 1923, de Havilland had embarked on

a new era of development, designing aircraft for public transport, not just for military service; enter the de Havilland DH50. The DH50 was a watershed advancement. Capable of a cruise speed approaching 100mph with an enclosed cabin for four passengers, it could be powered by a number of different engine types. Once the purchase of its first DH50 was finalised, the board entered into a contract with de Havilland to build its own DH50s under licence. The small (now heritage-listed) hangar at Longreach took on the added role of a manufacturing workshop.

With a new concrete floor, production jigs, tooling and DH50 components arriving regularly, Baird took charge of an ever-increasing team of carpenters, fitters, mechanics and shop hands. While Baird's team churned out a new DH50 every six months, Fysh, working in a small office in the corner of the hangar, managed the day-to-day operations, employing more pilots for the ever increasing services. Men such as Lester Brain and 'Skipper' Moody who would become giants of the Australian aviation scene accepted their Qantas wings in this small office against the backdrop of hammers, band-saws and Baird's music player.

For Qantas, the latter years of the 1920s was a period of expansion and diversification. By September of 1929, six newly constructed DH50s graced the skies, and two of the even larger and faster DH61 aircraft had entered service flying from Archerfield to Charleville and competing directly with the railways. The larger seven passenger DH61 added a new dimension to Australian skies that could rival even Gene Roddenberry's *Star Trek*. With the introduction of the first Australian aeroplane washroom in regular service, finally, one could 'go' where no man has gone before'.

Though flying remained a risky business – to the extent that the aircraft could not as yet be insured and passengers had to sign a waiver before boarding – a new breed of private pilots was slowly emerging. Meeting the demand for this 'novel venture of aviation', Qantas established flying schools at Longreach and out of the new Hangar 4 at Archerfield, under the control of Lester Brain.

Meanwhile, the first DH50, *Iris*, had entered a new role that would one day see it immortalised on the Australian $20 note. For almost a decade, the Reverend John Flynn had passionately campaigned for an aeromedical service – his 'Mantle of Safety' for the outback. Finally, his dream came true when a contract was struck between the Civil Aviation Authority, the Australian Inland Mission and QANTAS with Arthur Affleck as pilot and Dr St Vincent Welch on board, *Iris* was pressed into service in May 1928 from its new Flying Doctor home in Cloncurry. Qantas would continue in this role for almost 20 years until TAA took over the Royal Flying Doctor Service contract in 1947.

With the dawn of the 1930s came ambitious expansion into international flying. KLM was flying south east as far as India and in 1931 Imperial Airways launched a trial flight from Croydon in England to Australia. The benefits of connecting the two countries with an aerial mail service were readily apparent, but again it came down to the right choice of aircraft and some form of financial backing or joint venture. Qantas put itself squarely in the middle with a view to being a substantial part of the overseas service. For three years, the governments and airlines deliberated over how the final outcome would transpire. Qantas, having no multi-engine aircraft was initially unable to take on any over water services. For a time, pilots would fly the mail as far as Darwin where Kingsford Smith would take over in *Southern Cross*, flying on to Koepang, Indonesia. There, the mail would again transfer, this time onto an Imperial Airways aircraft for the remainder of the journey to England.

The negotiations for a long-term government contract to solidify the route were extensive and protracted. Eventually, the Australian Government accepted Qantas' tender involving a 50/50 arrangement with Imperial Airways, to form Qantas Empire Airways (QEA). The Australian Government awarded the five-year contract based on the new de Havilland DH86 four engined aircraft, with the inaugural service scheduled to depart from Brisbane on 10 December 1934. The old Queensland And Northern Territory Aerial Services company was dissolved and QEA was born.

At the time of ordering, the DH86 was still at the conceptual stage providing QEA an opportunity to make substantial contributions to the final design. Initially the DH86 was built with a single pilot cockpit, but Brain pressed de Havilland to introduce a two-pilot cockpit design to help alleviate fatigue on longer sectors. The DH86 was sleek, fast and streamlined and its cabin accommodated up to 10 passengers in spacious comfort, but later critics decried its hurried introduction as potentially causal to several serious accidents.

ANA and Holyman's Airways had secured DH86 aircraft early in production and introduced them into service in Australia. With the first QEA service just weeks away, Brain arrived in Australia with the first DH86 at the end of a flawless delivery flight, knowing a second would follow shortly under the command of an Imperial Airways pilot, Pendergrast. Meanwhile, DH86 *Miss Hobart* operated by Holyman's Airways had disappeared

TOP The DH 86 introduced QEA to the world.

ABOVE The passenger cabin of the DH 61.

RIGHT DH-86 overseas signpost poster.

BELOW LEFT QANTAS DH61 with its smaller brother, the DH50, in the background.

without trace between Launceston and Melbourne. Then, just after dawn on the 15 November 1934, a second disaster occurred. Pendergrast, with co-pilot Creetes, engineer Charlton and Shell representative Broadfoot aboard, entered a flat spin just a few miles short of the Longreach airfield at the end of their delivery flight, with the loss of all onboard.

The DH86 was immediately grounded and other arrangements were made for the inaugural flight from Brisbane to Singapore. Under the watchful eye of the Civil Aviation Authority, extensive testing by Qantas staff including Brain, Fysh and Baird was undertaken to determine if the DH86 was safe to fly or whether a sinister problem lurked beneath its sleek exterior.

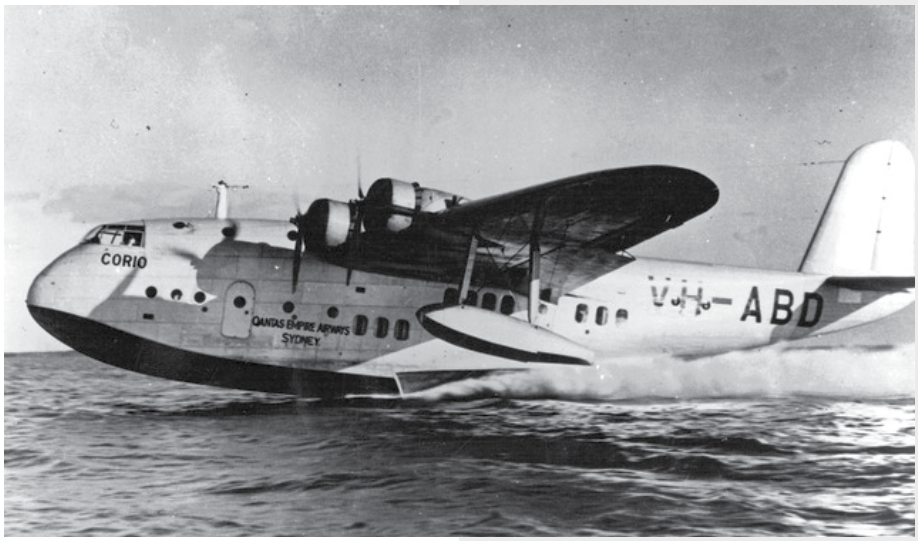
In the end no immediate deficiencies were discovered, but some evidence was found that if the centre of gravity moved aft of its limit in flight, the underpowered tailplane and rudder could not provide sufficient control for the pilot to recover. The second DH86 had been carrying a spare engine in the cabin on its delivery flight, and this, combined with the discovery of Pendergrast's body in the toilet at the rear of the cabin gave weight to the argument. With scrupulous adherence to its flight envelope and improvements to the rudder and elevator controls, the DH86 re-entered service. It had been a dark beginning to the new international operation, but with a new found respect for the aircraft, the DH 86 would continue safely in Qantas service for many years.

At the time, the flight to England was a dizzying array of transport changes for its passengers. Five different aircraft types - some flying boats but all unpressurised of course, two train

journeys, 31 stops and anything from 10 to 12 days to complete, it was a trip for the adventurous soul. Not merely a flight of convenience that cut the sailing time by two thirds, it was perhaps rightly described as a journey of mystic lands and peoples. Alexander Frater's *Beyond the Blue Horizon* presents a commendable and comprehensive travel book on the subject.

In the late 1930s, with the Australia to England contract up for renegotiation and a burgeoning load of mail and freight, QEA again needed to take a huge leap forward. By 1938, the service was carrying nearly 5,000 passengers and more than 400 tons of mail annually. With a view to streamlining the service and the eventual operation all the way to England in its own right, Qantas, entered the flying boat era. Selecting the Shorts brothers S23, C Class, Empire Flying Boat for the renewed contract brought with it many challenges, not the least of which was teaching its pilots how to sail. The route, dubbed the Kangaroo Route, had to be re-surveyed and sea bases established. Qantas head office relocated to the Shell House in Sydney as Rose Bay became home for the Empire fleet. Qantas was growing up. By 1938, the airline had a paid-up capital in excess of half a million pounds, a staff of 228 and conducted everything from flying schools and the Royal Flying Doctor Service to International operations.

Built in Rochester England, the six C Class aircraft under Qantas control



– Coolangatta, Cooee, Carpentaria, Corio, Coogee and Coorong, carried 15 passengers, two crew and three cabin crew. They were twice as long and four times heavier than the DH86s they replaced. Though they only reduced the journey time to England by a day, they set a new standard in flying with greater space and comfort, full-service meals, and maybe a game of quoits or golf on the promenade deck afterwards. Introduced to the run in July 1938, their opulent passenger appeal would be short-lived as they would soon be pressed into a more important service - defence of the country.

The significant contribution and sacrifice of Qantas and its crews to the wartime effort is too important and extensive to be adequately encapsulated here, so the next article in this series will explore Qantas at war in more detail. For now, let's taxi forward a little to 1945.

As the war drew to a close in 1945, Qantas could have been forgiven for giving it all in and shutting up shop. A decimated and ageing fleet of aircraft gave little inspiration, but the 15-year contract to fly the Kangaroo Route signed in 1938 still had several years to run. In fact, throughout the duration of the war Qantas had maintained a secret air link with England using a fleet of Catalina aircraft. Unfortunately, under the terms of use, Qantas was forced to scuttle all the Catalinas at sea after the war. With little left of the Empire fleet, Qantas now went shopping for used military aircraft that could be adapted to civilian service.

TOP Corio taking off.

CENTRE QEA DC4.

ABOVE Christening Lockheed Constellation VH-EAM.

LEFT
Flying boat base, Rose Bay, Sydney.

BELOW
QEA poster featuring L-749 cutaway.

BOTTOM
Southern Zephyr and *Southern Aurora* preparing to make history.

Lancastrians went into service on the Kangaroo Route to supplement what was left of the Empire Flying Boats. You could take the improved flying boat service in six days to London, or a Lancastrian in under 70 flying hours – provided of course you preferred sideways seating and windows only on the starboard side of the aircraft. C47s were converted to DC3s and began operations into New Guinea, and Liberators flew to Colombo. As more flying boats became available, flights to Noumea, Fiji and New Zealand were supported with second-hand Catalinas, while DC4s pressed operations up into Asia as far as Hong Kong and Japan. The successful operation of such a diverse fleet and network took a dedicated team, a team that grew together as a family.

In 1947, the Australian Government bought all shares in the Qantas company. Earlier in the year, Fergus McMaster had stood down as Chairman due to age and ill health, handing the mantle to Hudson Fysh. Fysh was now both Managing Director and Chairman of the government-owned company, and in charge of an airline already taking its next big leap. Enter the Lockheed Constellation.

In 1946, Qantas signed a contract with Lockheed to purchase the first of six L749 Constellations. Eight years later they would take a further 19 of the larger L1049 'Connies'. Qantas had been forced under the terms of the original contract to fly only British made aircraft on the Australia to England route. Limited post-war production, however, severely hampered the available options coming out of the British Empire. Imperial pressure was on the company to accept the yet-to-be-proven Tudor II airliner, while the Americans were already building and flying vastly superior aircraft and at competitive prices. As far as Qantas was concerned the Lockheed Constellation met and exceeded their every requirement. After continued lobbying, Prime Minister Ben Chifley approved the Lockheed deal and pilots, engineers and maintenance staff began their training in Burbank, California.

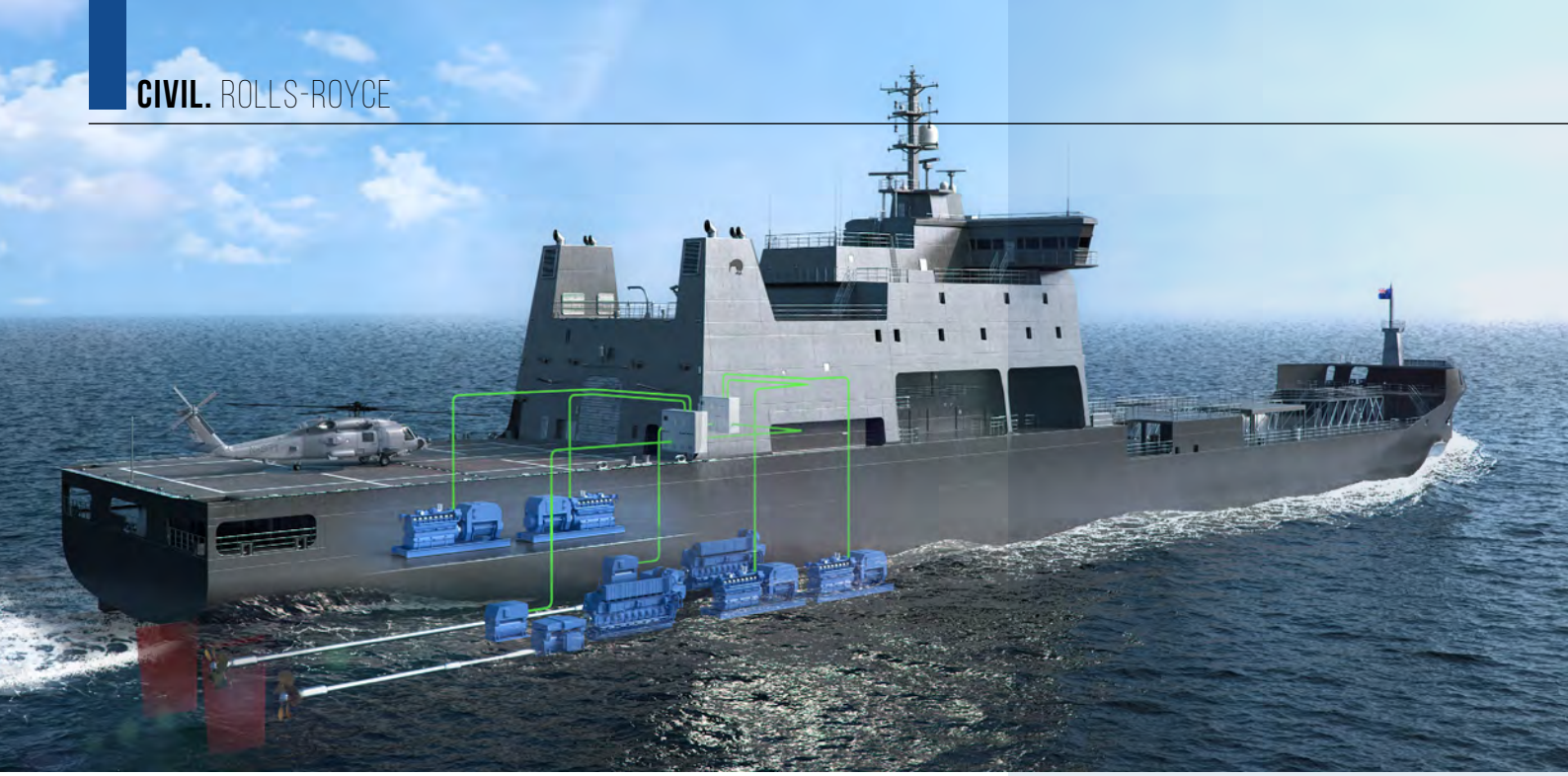
The elegant Constellations transformed Qantas yet again. First-class service, pressurised cabins and cruise speeds around 300mph reduced the London service to four pleasant days' travel – with two nights in the air and two in hotels along the way. For the first time, Qantas employed female cabin crew. Applicants had to be single, between 22 and 27 years old, between 5'3" and 5'6' tall, under 60kg weight and hold at least a Nursing Certificate.

The Constellations expanded the network into Africa, Asia, Europe and America. By 1958, you could fly around the world with Qantas. Famously, on the 14 January 1958, two L1049 Super Connies taxied out at Melbourne together – *Southern Zephyr* (VH-EAP) departing westward for London via the Kangaroo Route and *Southern Aurora* (VH-EAO) departing eastward on the new Southern Cross route. Two days later, the aircraft crossed paths in London before continuing their journeys arriving back in Australia 128 hours after departing.

Qantas and Australia had come of aviation age, but this was the beginning of the end for the propeller era. WWII innovation and the inventive work of a square-jawed Coventry lad named Frank – the cherished son of Moses and Sara Whittle – would put pay to that. Air Commodore Sir Frank Whittle's jet engine would ring the death knell for large propellor airliners, and Qantas would move into the jet age.

To be continued next edition.

Don Hill, Qantas Pilot & Director, Qantas Founders Museum



A DIVERSE ENTERPRISE

ROLLS-ROYCE CONJURES IMAGES OF PRESTIGIOUS CARS AND POWERFUL AIRCRAFT ENGINES, BUT TODAY IT IS A DIVERSE ENTERPRISE THAT INCLUDES SHIP DESIGN CAPABILITIES AND HYBRID ENGINE TECHNOLOGY.

ROLLS-ROYCE HAS BEEN an integral partner to armed forces across the Asia Pacific for many decades, from powering the RAAF Hawk aircraft to a recent contract to power the FFX Batch-III frigates in South Korea.

The Royal New Zealand Navy (RNZN) recently took possession of a new polar-class sustainment vessel, HMNZS *Aotearoa*. With a displacement of 26,000 tonnes, *Aotearoa*'s primary duties are to provide global logistical support to sovereign and coalition maritime, land and air units. From inception through to entry into service, Rolls-Royce has been intrinsically involved with the program, specifically the vessel concept design and hybrid electrical and propulsion systems.

Built by Hyundai Heavy Industries in South Korea, HMNZS *Aotearoa* has specialised winterisation capabilities for her operations in Antarctica. The innovative wave-piercing hull is based on a Rolls-Royce concept design, the first time that design has been implemented in the naval sector. Thanks to its bow shape, the ship has greater seaworthiness, is more manoeuvrable and has particularly low water resistance, thus reducing fuel burn and emissions.

HMNZS *Aotearoa*'s entry into service represented a significant milestone for Rolls-Royce. Drawing from its world-leading range of power and propulsion equipment, the program has become a showcase for Rolls-Royce's first naval hybrid propulsion system.

The combined diesel electric and diesel (CODLAD) system is powered by two Bergen B33:45L9P diesels supplemented by two electric power take in motors and two controllable pitch propellors. Electrical power is supplied by four *mtu* 4000 Series diesel generators distributed by an electrical power management system through 690v main switchboards. The switchboards distribute power to the active front end drives for the propulsion motors and bow thruster.

The hybrid system provides an optimised and flexible power plant featuring numerous fuel saving modes. Driving the ship using electrical power while simultaneously powering the ship's hotel services (lighting, pumps etc) and mission systems reduces the vessel's fuel consumption and thus emissions. The *mtu* 4000 generators incorporate a selective catalytic reduction system to ensure the ship complies with the strict IMO III emission guidelines. Maintenance costs of the hybrid-electric system are also significantly reduced in contrast to a mechanically powered warship.

Rolls-Royce was also contracted to integrate the critical power generation sub-systems to support the high-power capacity required for a polar-class ship to ensure sustained operations in the cold Antarctic environment.

ABOVE HMNZS *Aotearoa*. Photo: RNZN.

A LASTING FOOTPRINT

A VISIT TO A REMOTE VILLAGE IN THE JUNGLE CONTINUES TO STIR REFLECTIONS ON LEADERSHIP, SELF-ENTITLEMENT AND THE VALUE OF THE PUB TEST – 25 YEARS LATER.

OUR COMPANY DELIVERED realistic survival training to the public. On one occasion we were asked whether we could train some geologists working for a mining company in Irian Jaya (now Papua), Indonesia. The geologists were conveyed into survey areas by chopper and winched into tight places to get assay samples. The operation was carried out in the most remote locations. The terrain was formidably steep with spectacular chasms and covered in jungle.

Each chopper carried about three geologists who were winched down individually as the chopper covered a grid pattern and then winched back up 30 minutes to an hour later. Between winching episodes, the chopper left the immediate area. The weather was often chancy with low cloud, rain and thunderstorms. It could close in rapidly, making extraction difficult or impossible. The worry was that there was a possibility the chopper, due to weather or technical difficulty, might not get back to the geologists in a timely fashion to lift them out.

The geologists had become quite complacent about their risk of becoming isolated in the jungle for an unknown time and relied on the chopper always being able to extract them. That led to sloppy jungle safety and survival protocols. Most were working in unsuitable clothing and did not carry even basic survival equipment. Despite insisting the geologists introduce better standards, the company found difficulty gaining enthusiastic participation.

INTO THE WILD

A month later we met our group of 10 geologists at Cairns airport. We took them to a nice hotel, booked them in and asked them to meet us in an hour. We told them we were going into the jungle and they should wear and carry what they normally took with them in the chopper.

We loaded them into two four-wheel-drives and took off down the road. They sat there happily, chatting and looking at the scenery as we drove. We were headed up into the Paluma Ranges, west of Cairns. After 90 minutes, we stopped the 4WDs in the middle of quite a dense area of jungle. True to form, they were dressed in what you might call casual clothing with next to no equipment. All of a sudden it dawned on one of them: "Damn, we are being left here". Questioning eyes looked at one another. As the light slowly dawned around the

group, the question was blurted out: "How long are we here for?"

Surprise! "Your helicopter left you here one hour ago. It has not come back. The weather has closed in. We cannot tell how long before the chopper can get back in."

The looks on their faces were priceless: disbelief, consternation and nervousness. I felt a little uneasy about the subtle deceit we'd applied by not telling them the full story.

Their first night and the next day were rather a survival disaster. There was plenty of discomfort, some hunger and thirst but very little organisation or focused action. Signs of them getting together to plot the remaining days were limited until one of the geologists showed a few bush skills.

John had grown up in Papua New Guinea with the local population. He had brought his favorite sling shot with him and was deadly accurate at about 20m. All of a sudden, the group's interest was grabbed when John started chasing a bush turkey. All the group could see was food. Morale rose and so did the action on a survival plan.

With our input, they learnt to build a signal fire, milk water from their surrounds including the trees, rig shelters from bush materials and gather and catch bush food. For the first time in their lives, they experienced true hunger and thirst. They had a hard time, but they succeeded step by step.

Five days later, our geologists stood in the same clearing as on day one. They had developed a new appreciation of being caught out in the jungle. We loaded into the 4WDs and headed back to the hotel. They had set themselves rules and standards and were now a professional, organised lot. Team spirit had shot through the roof.

IRIAN JAYA

We went to visit the team in Indonesia two months later to experience their day-to-day operations and see whether we could add anything to their working life and our training program. We choppered out with them on their day's work.

The terrain in which they operated was mostly precipitous and covered

in dense jungle. The area was dotted with small villages separated by huge distance and mostly impassable terrain. There were no roads or infrastructure. Sometimes a maze of rugged jungle trails in a few places, but not all, allowed villagers to trek to other settlements, often involving arduous, multiple day journeys.

Some villages are as remote as it gets anywhere in the world; two were much more than a day's arduous trek apart. The people of those villages could often see and communicate by voice across a ravine that seemed bottomless and was full of rushing water. I swear some of the villages were so remote that possibly the people had never seen anyone from outside their community.

Amazing country but no wonder the mining company wanted improved survival behaviors.

We were there for more than a week. During that time, I was to experience a surprising event. More than 25 years later, it still is strong in my mind.

The mining company had a good-will project visiting villages by chopper to experience their culture and possibly contribute some tools and we went on some of those visits.

The people were strikingly friendly, somewhat timid but very caring. Most had no wheeled transport, no mod cons of any nature and were in awe of a helicopter and the people in it. Some places we could land at, others we had to winch into.

On one visit we took a generator as well as tools and showed the villagers some video of themselves and their community that we took during the first hour we were there. The expression on their faces was priceless.

FAIR EXCHANGE?

I winched in to one village full of trepidation. As the chopper left, we were met by a group of men who looked very intimidating; bows, arrows, bones and a decidedly rugged look. In contrast, one of them carried a piece of what looked like fruit. So, time for the opening gambit. I pointed at his fruit and then held my hat floppy out toward him. Maybe trading would bridge the gap. He cracked a big smile as we exchanged our gifts. Then it was on for young and old. Big smiles by all and much touching of his new hat and touching of "them people from the sky". After a couple of hours, we said goodbye, winched up, fruit on board, and departed. Our last sight was enthusiastic waving.

We camped for the night in hoochies near another village about 10km away across difficult terrain. I woke at dawn to a huge commotion and was surprised when one of the locals beckoned me.

I stepped out into the commotion to see my hat, last seen in the remote village, proudly worn by the villager I had traded with. He was clutching two pieces of produce.

Somewhat taken aback, my immediate thought was, how the heck had he got here and had he come to demand another hat? Had I shortchanged him? Would my deal have passed the pub test?

With the help of the locals, I ascertained that he actually thought exchanging a hat for just one piece of

fruit was unfair and insisted I accept two extra pieces of fruit. After I, as graciously and humbly as I could, accepted, he trotted off into the jungle head held high. I could not believe he had found us, presumably walking through the night, nor understand what had driven him to such lengths.

THE PUB TEST

I have reflected on that event regularly ever since, marveling at the whole thing. Incredible that even now when I am the slightest bit resentful about going out of my way for another, I am quickly brought back into line recalling my village friend. His was not a Western-learned or a workplace-regulated behavior. It was a behavior bred way out there in the middle of nowhere.

Think about it: are we instilling those behaviors and leading by example in our own family and social networks? Is our society strong in that type of behavior? Are we a society too influenced by self-entitlement? In my daily life, I see politicians evidencing entitled behavior. I hear of many scams. I see road rage. I know of people ignoring COVID rules. I see fighting in supermarkets over toilet paper.

My experience in Indonesia 25 years ago keeps causing me to ask of myself questions that provoke more questions. Would I reactively trust, as a compatriot, the local who traded for my hat? My word I would because of his demonstrated desire for fairness. Can I have the same reactive thoughts of the politicians in this country, or many large businesses, banks, lawyers and more? Is our country heading in the wrong direction as people vie for power and wealth instead of fairness, honour and empathy to give service to our nation? Those big questions leave me perplexed.

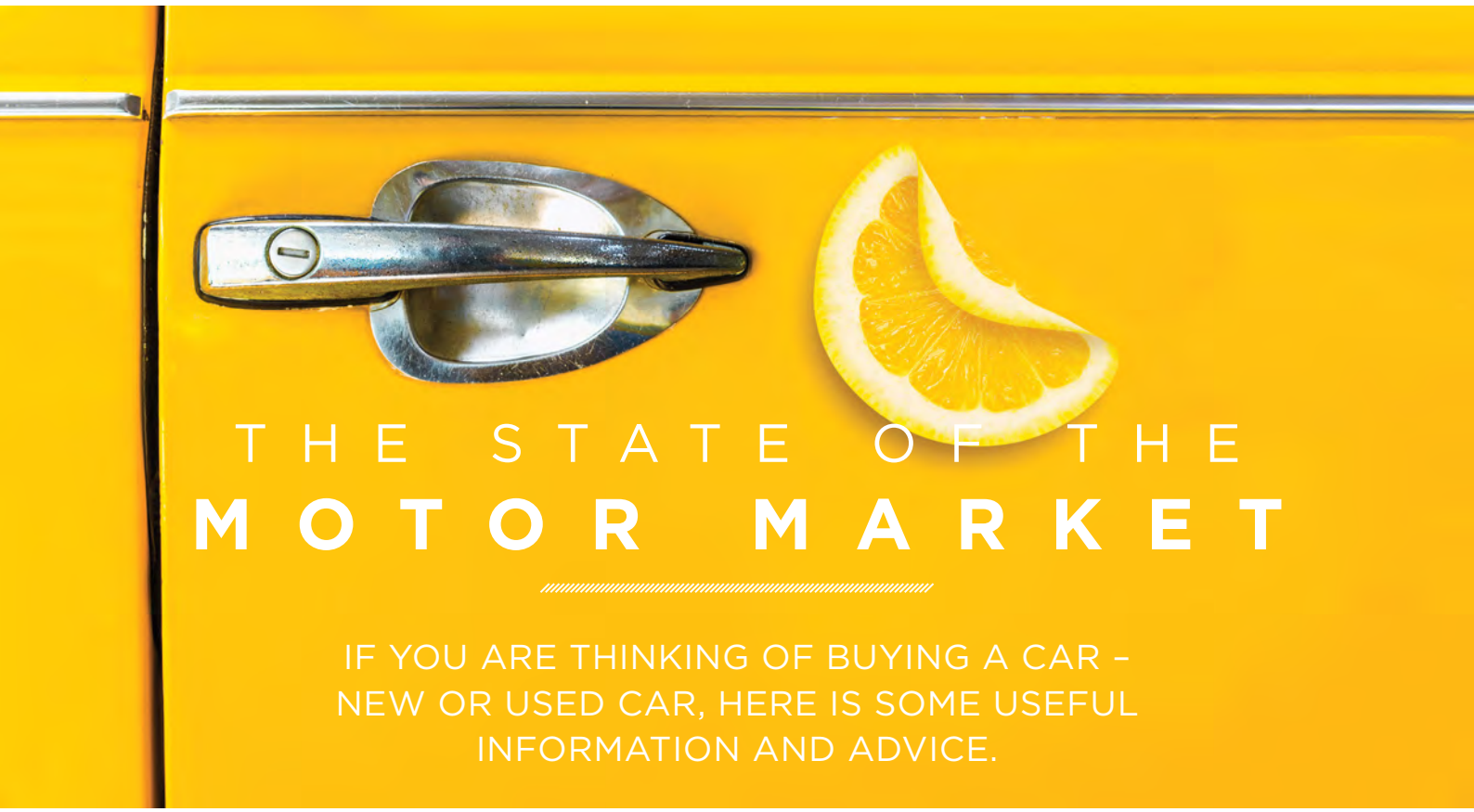
The behavior of the man from the remote village passed the pub test for sure. It made me rethink my behaviour in fooling the geologists about where and why we were going in the 4WDs. Would that pass the pub test?

I have reflected on that situation all these years later.

Leadership often walks a pretty thin line. I think most people reactively look at a leader's motivation and see either 'for the good of the group' or 'a glory or power trip for the leader'. I believe our decision was for the good of the group.

Passing the pub test is such a good measure of leadership behavior. Pity we do not teach it in schools and community groups, let alone workplaces. We need people in the world to make us reflect on our behavior. The village man with the hat has had a permanent effect on my life, as has the survival course and its participants. Disparate peoples from remote Irian Jaya. Weird, the characters that come into your life and leave 'footprints'.

Peter Ring,
Principal, Lingk



THE STATE OF THE MOTOR MARKET

IF YOU ARE THINKING OF BUYING A CAR – NEW OR USED CAR, HERE IS SOME USEFUL INFORMATION AND ADVICE.

NEW CAR GLOOM

The first half of 2020 saw the worst new car market since the global financial crisis. The story didn't change much until the last two months of the year, when the Federal Chamber of Automotive Industries reported an increase of 12.4 percent in November compared to the same period in 2019 and an increase of 13.5 percent in December 2020.

Overall, according to CarAdvice, new car sales for the whole of 2020 were the lowest in 17 years and it was the first time the Australian new car market dropped below one million since 2009. The signs are that the new car market will bounce back in 2021, but that depends on the course of the pandemic and its impact on consumer confidence and the wider economy.

Within the overall figures, some brands have fared better than others with popular SUVs, utes and 4WDs showing better sales results than conventional sedans.

Whatever the state of the market, before you act, do your research, take your time, don't be pressured, don't be afraid to walk away, be bold about asking for the best deal and try to seal the deal as close as possible to the end of the month when sales figures are about to be finalised.

Also, don't overlook the considerable benefits of buying a new car in 2021 with 2020 compliance and build plates. In most cases, the older those "new" cars become, the harder they are to sell. Consequently, they will often attract an additional discount just to move the stock and will come with a comforting new car warranty.

USED-CAR BOOM

The 2020 story of (mostly) doom and gloom for new car dealers was quite the opposite for used cars.

According to CarAdvice, "pre-loved" cars were increasingly hot property in Australia, with a surge in prices since April 2020 as buyers avoided public transport and new car dealers experience supply shortages. According to data from Moody's Analytics, July 2020 used-car prices broke records for a second successive month, recording a 16.2 percent rise on pre-pandemic prices and a massive 30.8 percent increase on prices experienced during the April 2020 slump.

In addition, domestic air travel had declined by over 90 percent by May 2020 because many interstate travellers decided to take a drive for their family holidays and business trips. As a result, demand for used cars outweighed supply, making late-model, low-kilometre vehicles harder to find. That has pushed up wholesale prices right across the board.

Valuers and auctioneers are reporting the most in-demand used vehicles are SUVs and utes, especially those that have travelled less than 60,000km with low fuel consumption, a good service history and some new car warranty remaining. The highest demand is for

the likes of Toyota, Mazda, VW, Hyundai, Kia and Subaru, all of which have reputations for reliability and reasonable maintenance costs.

The same phenomenon has been observed in the classic car market. For example, Gray's Auctions recently reported the on-line auction sale of a 1973 Ford Falcon XA GT at a remarkable price of $300,909. Shannons Auctions has reported similar results, noting a "you only live once" attitude of buyers during the pandemic.

The obvious question is, how long will that last? Logic says the used-car market frenzy will ease as more sellers come to the market to take advantage of higher prices. The trend may also moderate with the withdrawal of most government financial support in March 2021.

The key point is that if you buy a used car now, take your time, do lots of research, buy the best quality vehicle rather than the cheapest one and set a target price beyond which you'll walk away.

That's not dissimilar to buying real estate at auction. Just like houses, there are plenty of cars out there and another one will come along, sooner than you expect. W

6 car buying tips

1. Have a pre-purchase mechanical and body inspection. That must be non-negotiable and it must be independent. If the seller won't agree, walk away.

2. Check the car's clear title and accident history through your state or territory motor registry website. Otherwise, you might be buying a car that has an outstanding financial encumbrance (loan or debt) or it might have been financially written off by an insurer after an accident. The former can lead to the car being repossessed. The latter, called a "repairable write-off", may not be eligible for insurance.

3. Make sure the car has a strong and documented maintenance history from new in Australia. If the car was imported from overseas later in its life, pay special attention to its history and country of origin. Most overseas imports sell at substantial discounts, reflecting the risks inherent in buying such a car (covered-up rust, dodgy repairs, stolen, non-genuine parts and engines).

4. Be prepared to pay more for peace of mind. Buying a poor-quality used car, or a 'lemon', at a cheaper price will usually end up costing more in repairs, maintenance and frustration.

5. Late model used cars purchased from dealers often come with a short statutory warranty period (usually three months). Whether a statutory warranty applies or not, buyers are often convinced to buy a used-car warranty through an insurance company on which the dealer is usually paid a commission. Alternatively, a policy is "thrown in" to sweeten the deal rather than offering a discount on the list price. Those warranty policies are sometimes best described as junk insurance because they are often written in such a way that claims are difficult to make and/or limited in value. You can read more about your consumer rights and warranties at accc.gov.au.

6. Purchase comprehensive car insurance before you drive away. There are many stories of newly purchased cars being damaged or written off within five minutes of purchase, so don't risk it.

WORDS Flying Officer (AAFC) Paul A Rosenzweig

GOLD AWARD FOR GLIDER PILOT

IN OCTOBER 2020, three Australian Air Force Cadets (AAFC) members received a special certificate from the Governor of South Australia recognising their completion of the Gold Award of the Duke of Edinburgh's International Award.

One of the three, Aircraftwoman (AAFC) Tharane Thamodarar served with No.604 Squadron at Hampstead Barracks, SA, rising to the rank of Cadet Flight Sergeant and holding roles such as Recruit Flight Commander and Assistant Training Officer.

A highlight of her service was being Catafalque Party Commander for a service of commemoration marking the 59th anniversary of the end of the Malayan Emergency and the 53rd anniversary of the end of the Indonesian Confrontation with Malaysia. She also led the 604 Squadron team to victory as the best squadron in 6 Wing in the 2019 Catalina Cup competition.

As a leading Cadet, Tharane was awarded a scholarship to undertake flying training with the AAFC. She trained in the DG1000S soaring sailplane from Stonefield, Gawler and Balaklava airfields with 906 Aviation Training Squadron, now known as Balaklava Glider Training Flight – one of three centres of excellence that make up the new Gliding Training School.

"On 14 March (2020) I flew my first solo flight at Gawler Airfield with the Adelaide Soaring Club, after some additional training in transferring back to aerotow and respective procedures," Tharane said. "My flying in the AAFC and with Adelaide Soaring Club helped me learn from different instructors and gain experience in different environments and aircraft."

Her efforts to improve her knowledge and ability in aviation contributed to the skills section of her Gold Award.

The Duke of Edinburgh's Award is an enriching program in which young people aged 14 to 25 participate in a number of activities and non-formal education to qualify for Bronze, Silver and Gold Awards. It was founded in 1956 by HRH The Prince Philip, Duke of Edinburgh and now operates in more than 130 countries and territories across the globe.

For more information, see aafc.org.au/what-we-do/duke-of-edinburgh-award.

ABOVE LEFT Tharane Thamodarar receiving her Gold Award certificate at Adelaide Town Hall from His Excellency the Honourable Hieu Van Le AC, Governor of South Australia. Photo courtesy of The Duke of Edinburgh's International Award – South Australia.

CADET PILOT Q+A

AS SQUADRONS RESUME PARADE NIGHTS, with appropriate precautions, there have been opportunities to recognise achievements.

No.704 (City of Wanneroo) Squadron at Madeley, WA, resumed parades during Term 3. The Squadron's Acting Cadet Corporal Jack Shadwick has been approved to wear the prestigious AAFC First Solo Badge. During the squadron's operational pause, Jack continued his powered flying training with an approved external service provider. He spoke to Wing Aviation Liaison Officer for 7 Wing, Pilot Officer (AAFC) Alex Hartner, about his impressions of flying solo.

WHAT WAS SPECIAL ABOUT THAT DAY?

"It was 14 April 2020. I was excited knowing I was going to do what I

love most. I was going to fly a plane, but today was not just some ordinary flight training. It would be the most memorable day I would ever have. It was the day my instructor would put the aircraft in my hands. I was going to do my first ever solo, aged 15."

WHAT WAS YOUR EXPERIENCE OF FLYING SOLO?

"I jumped into the Cessna 172 with only 9.4 hours under my belt. My instructor, handing over the controls, exited the plane and left me to do just one circuit in the Jandakot circuit area.

"Full of excitement but with nerves at the same time, I taxied out to the runway and took off on 24L for one circuit with five people already in the air. It was a time that I needed to maintain focus the whole time.

"I did the one circuit, touched down, and the air traffic controller congratulated me as I exited off the runway. I had an absolutely great experience and a tremendous amount of fun.

"I would just like to thank the Australian Air Force Cadets and Major Blue Air on making flying and learning aviation the best experience ever."

OPPOSITE BELOW CCPL Jack Shadwick receives his first powered solo flight commemorative patch from the Executive Officer of No.704 Squadron, FLGOFF(AAFC) James Firkins.

READY TO FLY

DURING THE OPERATIONAL pause in Cadet activities, the Elementary Flying Training School (EFTS) of the AAFC has managed to keep flying.

"Unfortunately, it's not the type of flying – or as much flying – that EFTS wants to be doing, which is to be inspiring the Cadets," said Squadron Leader (AAFC) Scott Wiggins, Staff Officer Operations for Aviation Operations Wing, AAFC. "Instead it's the essential task of keeping our fleet of DA40 NG aircraft serviceable and keeping certain nominated pilots and flying instructors current on the aircraft type.

"There are many restrictions on these operations, like solo flights only and the aircraft being quarantined for a period of time after each flight, along with the extensive aircraft cleaning inside and out.

"This is all in order to make the return to normal operations and transition to flying with Cadets again post-COVID as smooth as possible."

Aviation Operations Wing delivers flying pathways through gliding and powered flying experiences and training. The EFTS comprises three flights, which will conduct powered flying activities based out of RAAF Base Amberley, Queensland, RAAF Base Richmond, NSW, and Point Cook at RAAF Base Williams, Victoria.

The Diamond DA40 NG was chosen to provide a safe, comfortable and efficient means of positively inspiring young cadets' interests in the aerospace and technology industries.

DA40 NG VH-UEO on approach to Essendon Airport on 10 September 2020. Photo courtesy of an aircraft spotters group at Essendon Airport.

INSPIRING BUDDING

AEROSPACE PROFESSIONALS

IN LATE 2020, the team from Cool Aeronautics, the STEM outreach program for the Royal Aeronautical Society, Australian Division (RAeS) presented an interactive, aerospace theory workshop titled Designing a Better Airplane to the cadets of Forest Lake Squadron, Queensland.

"My imagination was captured as a six year old while watching the Thunderbirds," said Sqn.Lt. Michael Hansen, Officer Commanding of Forest Lake Squadron. "That is what inspired me to join the aerospace industry and become an aeronautical engineer. But it takes more than just imagination to design an aircraft. You need to understand how aerospace engineers solve problems."

During the session, facilitated by Mal Benfer and Riley Purcell from RAeS Cool Aeronautics, cadets learnt about the application of the engineering design process in an aerospace context. In particular, the team highlighted the importance of using models, both physical and computer generated, to measure the effects of changes so design improvements can be made.

Cadets made paper gliders with movable control surfaces that they could change to measure the impact on the original configuration.

When asked about the activities, Cadet Biggs said: "By doing this activity, I learnt that it is very important to only make one change at a time. Then test the design again before changing anything else. By doing this we know what changes improve the design."

Cadets also experimented with different wing shapes and sizes to compare and contrast the effectiveness of their designs.

"It was a wonderful opportunity to share my aviation experience with the Australian Air League cadets," said Mal Benfer. "They all showed such enthusiasm for the activity and I was impressed with their aviation knowledge."

The squadron, which has boys and girls aged eight to 16, encourages a passion for aviation, along with curiosity and a desire to become a part of the aerospace industry.

"We have children in our squadron who are either considering, or have already embarked on, the first steps in a career in aerospace," said Sqn. Lt. Hansen. "Some want to be flight instructors, others engineers, designers or maintenance engineers."

Providing children with accessible STEM (science, technology, engineering and maths) activities is a vital first step in inspiring the next generation of aerospace professionals. Programs such as Cool Aeronautics engage their imagination and help show them how what they learn at school, or at the AAL, can be applied in pursuit of their dreams.

For more information about RAeS Cool Aeronautics email coolaero@raes.org.au.

ABOUT THE AUSTRALIAN AIR LEAGUE

The Australian Air League is a youth group 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 through classes in theory of flight, navigation, aircraft engines and a variety of subjects. The AAL also aims to enable them to achieve their full potential and become better citizens who can effectively serve the community. With Squadrons in most states, the AAL has been serving the community in Australia since 1934. It is entirely self-funding and is staffed by volunteers.

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

ABOVE AAL cadets preparing their prototypes for a test flight with the assistance of Mal Benfer.

ABOVE LEFT Cadets taking part in an aerospace theory workshop, Designing a Better Airplane.

CORPORAL JOHN ALLAN TATE

9 September 1933 – 1 December 2020

IN MARCH 1953, John was called up for National Service. He trained as an engine fitter, graduating on 6 August 1953 and during that time completed a course at the School of Combined Land/Air Warfare.

He served much of his time in the Air Force at Williamtown working on Vampire aircraft, at No.77 Squadron and No.2 Operational Training Unit.

His colourful character came to the fore during one practice bayonet drill period when his instructor was so exasperated with him that he inadvertently stabbed Allan's foot - the bayonet penetrating the leather between the big and second toes!

Extra curriculum activities included boxing competitions and martial arts – interspersed with periodic brawls leading to periods of detention. He discharged from the Air Force in September 1953.

John subsequently became President of the Newcastle Branch of the RAAF Association, an office he held for over 20 years until the branch became part of the Fighter Squadrons Branch. During that time, he single-handedly organised the annual Battle of Britain ceremony in Newcastle and was a regular attendee at Service ceremonies on the Central Coast and in Newcastle. He was a stalwart of the Association.

For his commitment to the conduct of remembrance ceremonies and dedication to serving veterans, John was awarded the RAAF Association State President's Certificate of Appreciation in 2017. In 2018 he was presented with a Newcastle Volunteer Service Award by Federal Member for Newcastle Sharon Claydon.

AIR VICE-MARSHAL HANS JORG FRIEDERICH ROSER AM

9 September 1933 – 1 December 2020

HANS WAS RAISED in the Freiburg region of Germany and emigrated with his family to Australia in 1949. In January 1955, Hans entered the RAAF College at Point Cook as a member of No.8 Course and graduated as a Pilot in December 1958.

His first posting was to No.23 Squadron at Amberley and then to No.76 Squadron at Williamtown in 1960, flying Vampires. He completed No.5 Sabre Conversion at No.2 Operational Conversion Unit in 1961 and was a member of No.76 Squadron when it re-equipped with Sabres.

After a tour in Department of Air in Canberra as a Personal Staff Officer, he was posted to No.78 Wing Butterworth, Malaysia in 1965, serving as a squadron pilot and later Flight Commander in No.3 Squadron. He completed four tours with No.79 Squadron in Ubon, Thailand. On return to Australia, he completed a Mirage OCU in 1968.

In 1969, Hans was selected to undergo USAF F-4C training at Davis Monthan AFB, before completing a tour of duty in South Vietnam at Cam Ranh Bay with the 12th Tactical Fighter Wing, flying Phantom aircraft on strike operations. For service with the USAF, Hans was awarded the Distinguished Flying Cross with Oak Leaf Cluster (US) and the Air Medal (US).

On return to Australia in 1972 and completion of RAAF Staff College, he was promoted to Wing Commander and served at Headquarters Operational Command. In January 1974, he assumed command of No.75 Squadron at Butterworth after which he returned to Canberra, on promotion to GPCAPT, as the Director of Air Force Plans.

Hans was appointed OC RAAF Laverton in January 1979. Two years later he was promoted to Air Commodore and posted as Director-General of the Tactical Fighter (Hornet) Program. He served as leader of the program until 1986 and said it was his most satisfying posting. He was appointed a Member of the Order of Australia for his leadership and performance.

On promotion to Air Vice-Marshal, Hans was appointed Commander Integrated Air Defence System in Malaysia-Singapore before returning to Canberra as Assistant Chief of the Air Staff –Materiel. He was subsequently appointed Assistant CDF (Personnel) until his retirement in the early 1990s.

Hans was chairman of several industry associations and a member of several Australian and overseas boards, including Eurocopter International Pacific.From 2000 to 2003 he was CEO of Thales International Pacific Holdings. More recently he was a director of ADI Limited and Thales Australia Holdings.

To all who had the privilege of knowing him, in both military and civilian life, Hans was a true gentleman and the epitome of a leader. They don't come any better.

SQUADRON LEADER BRUCE JOHN NIBLETT

20 October 1934 – 11 January 2021

BRUCE, or Knocker as he was known, served in the Air Force as a navigator and then as an air defence intercept director. He enlisted in the Air Force on 19 March 1957 and, after navigator training, served on No.11 Squadron at RAAF Richmond, flying maritime patrol missions in Neptune aircraft, then No.10 Squadron in Longnose Lincoln and Neptune aircraft in Townsville. He also served at RAF Base Butterworth.

Bruce left the Airforce in 1964 but rejoined in 1972 and was posted to No.1 Control and Reporting Unit (1CRU) and

completed training as an Air Defence Controller on No.30 ACO course. When 1CRU was disbanded in 1973, he moved to 2CRU at Darwin until Cyclone Tracy destroyed the radar station. He was subsequently posted to 3CRU at RAAF Williamtown. He served three years at RAAF Butterworth, Malaysia as the Air Defence Liaison Officer before returning to 2CRU in 1986 as the Executive Officer followed by a second tour as Executive Officer at 3CRU. He age-retired in October 1989.

Bruce assisted ADI/Westinghouse in the successful tender to acquire a modern air defence system for the Air Force and was subsequently recruited by Boeing as an air defence specialist and operations analyst, which included a move to Seattle, Washington, for six years while he contributed to the development of the B-737 Wedgetail airborne early warning radar and control aircraft, now based at Williamtown.

On return to Australia, he worked for Plexys Interface Products, an American firm, before retiring to Stockton.

Bruce joined the Air Force Association on 17 December 2009 and, following a period as Vice President, he was elected President of the Radar Branch on 21 April 2017, an appointment he held until his death. Bruce was well known for his quiet and welcoming friendliness and his self-effacing nature.

DOUGLAS RAYMOND LEAK, LEGION OF HONOUR

17 June 1923 - 6 January 2021

DOUG, ONE OF our last surviving Bomber Command veterans, was born at Menindee, South Australia and passed away at the age of 97.

He was one of the few to wear the recently instituted Bomber Command clasp to the 1939-45 Star. In 2015, Doug was appointed a Chevalier in the French National Order of the Légion d'honneur.

Doug was an active member of Mitcham Branch of the Air Force Association and in May 2015 received a certificate acknowledging 60 years of loyal membership of the SA Division.

On 8 December 1941, Doug applied for aircrew entry under the Empire Air Training Scheme and progressed through No.4 Initial Training School at Victor Harbor, No.1 Wireless and Air Gunner's School at Ballarat and No.3 Bombing & Air Gunnery School at West Sale to qualify as a Wireless Operator on 10 September 1943 and as an Air Gunner on 15 October 1943.

As a Sergeant, he attended No.2 Radio School in the UK in 1944, being promoted to Flight-Sergeant on 14 April. He then completed Marconi and Morse training and Advanced Wireless/Telegraph training at No.9 (Observer) Advanced Flying Unit at Llandwrog.

He graduated to No.26 Operational Training Unit at Little Horwood, and during 1944 trained in Vickers Wellington mark III, X and XVI long-range medium bombers. He then joined RAF Bomber Command – attached to 'D' Flight of No.1669 Heavy Conversion Unit based at Langar in Nottinghamshire from 5 January to 9 March 1945, flying in Avro Lancaster Mk II & III heavy bombers.

On 9 March 1945, Doug was posted as a Wireless/Telegraph Operator with No.149 (East India) Squadron RAF at Methwold, County of Norfolk (Lancaster Mk II & III bombers), and was promoted to Warrant Officer on 14 April.

He participated in five operational missions over Germany with 'A' Flight under Operation Pointblank (the Allied Combined Bomber Offensive), as a mid-upper gunner on Lancasters. Each mission lasted between five and seven hours, and his aircraft took fire each time.

The missions he took most pride in were the humanitarian aid missions over Europe with 'A' Flight and from 1 May 1945, he participated in six food supply drop missions over The Netherlands in

ARTHUR WILLIAM PARDEY

25 November 1924 - 31 December 2020

Arthur with 3SQN Mustang fighter-bombers at Lavariano, Northern Italy, 1945.

ARTHUR WAS BORN in Temora, NSW where his father owned a large flour mill. From the age of six, he was sent to board at Knox Grammar School in Sydney, where he met Chas Wannan, an older prefect who later became a No.3 Squadron Mustang Flight Leader.

Arthur enlisted in the RAAF on 30 January 1943, aged 18, and was selected to be a pilot and posted for his initial flight training to Temora.

After further training at RAAF Uranquinty, NSW, he departed for the UK by ship in January 1944.

By this stage in the war, there was an over-supply of aircrew trainees and Arthur had the lucky break of getting onto fighters instead of being sent to Bomber Command.

He was sent to Egypt and then to Northern Italy to join 3SQN at Cervia in the final few weeks of the war. He eventually shipped out from Taranto with No.3 Squadron in September 1945 and was back in Australia in time for his 21st birthday.

As a returned serviceman, Arthur took advantage of government educational support to train in flour mill management.

In another coincidence, he worked for a flour conglomerate owned by the family of Nigel Love, a former No.3 Squadron pilot in the Australian Flying Corps during WWI.

Arthur was a great supporter of 3SQN Association, including a period as NSW President. He had an interesting collection of war memorabilia, including "operational" maps that he "magpied" from the 3SQN Ops Caravan after the German surrender, which are now preserved with the Squadron at Williamtown.

support of Operation Manna. After the German surrender, the squadron dropped supplies to former POWs and ferried many ex-POWs back to England from the continent in Operation Exodus with 3rd Group, RAF Bomber Command.

Doug was committed to the Anzac March in Adelaide, and was a regular attendee at Air Force Association meetings and commemorative events.

SERGEANT HOWARD CAMPBELL

25 November 1924 - 31 December 2020

HOWARD, or Howie, joined the RAAF on 19 March 1957. His initial training was conducted at No.1 Recruitment Unit, RAAF Richmond, followed by a posting to the School of Radio, Ballarat, Victoria to train as a Radio Mechanic. However, this did not appeal to him and he remustered as a General Hand. In November 1957, he was posted to Base Squadron, RAAF Williamtown to assist with the formation of the Range Control Section for the air-to-ground ranges at Saltash and Morna Point.

After seven months' compassionate posting at No.2 Stores Depot, Detachment D, at Dubbo, NSW, he was posted to No.2 Airfield Construction Squadron at RAAF East Sale in February 1959 for four months before returning the School of Radio to undergo No.7 Aircraft Plotters Course.

Posted to No.1 Control and Reporting Unit at Brookvale, NSW, Howie completed Part 2 of the Plotters course before postings to No.2 Control and Reporting Unit (CRU) at Darwin and then to No.114 Mobile CRU at RAAF Butterworth which was on Wartime Operational Status during the Indonesian Confrontation.

Over the next 15 years Howie served at Nos 1, 2 and 3 CRUs as an Aircraft Plotter until his promotion to Sergeant in November 1969, when he was reclassified to Air Defence Supervisor. He was in Darwin when Cyclone Tracy destroyed the radar station.

Howie subsequently arrived in the Williamtown area when posted to 3CRU in February 1975 and served in that unit until his retirement from the Air Force in April 1977.

Howie joined the Air Force Association on 14 May 1999 . He was secretary of the Radar Branch for several years and served as a RAAFA Welfare Officer under the DVA/TIP scheme and on the NSW State Council. He was a stalwart within the veteran community and was an untiring advocate for veterans, widows and families in the Central Coast area. In 2017 he was awarded the National President's Commendation and was heavily involved with the Long Jetty Sub-Branch of the RSL until he passed away.

SQUADRON LEADER HUGHIE ALEXANDER COLLITS

15 June 1932 - 26 January 2021

A TALENTED SPORTSMAN, Hughie played in a prominent Rugby League club with a lucrative offer to play first grade in Sydney. However, he elected to join the RAAF.

Enlisting on 28 September 1953, he joined No.15 Pilots' Course at No.1 Flying Training School, Point Cook.

A posting to No.1 Basic Flying Training, Uranquinty on 26 February 1954 was followed by four months' posting to Central Flying School at East Sale, Victoria. He graduated as a Sergeant Pilot.

He was posted to No.2 Operational Training Unit (OTU) Williamtown on 23 November 1954 to undergo No.20 Vampire Conversion course. Following OTU and a short posting to No.22 Squadron, Hughie flew Sabre aircraft with No.75 Squadron and was commissioned as a Pilot Officer on 1 November 1956.

Between July 1958 and December 1959, he qualified as a flying instructor at Central Flying School and instructed at No.1 Basic Flying Training School at Point Cook. On 7 December 1959, he was posted to the RAAF College, Point Cook and served for two years during the reformation of the College as the RAAF Academy.

From May 1962 to November 1971, he had a series of postings to Nos 81 and 78 Wings, Nos 77, 3 and 76 Squadrons at RAAF Williamtown and RAAF Butterworth and 79 Squadron at Ubon, Thailand. On 29 August 1966, Hughie underwent No.7 Mirage Course at No.2 Operational Conversion Unit, RAAF Williamtown and was promoted to Squadron Leader on 1 January 1968.

Hughie was the Team Manager and spare pilot for the Deltas aerobatic team in No.77 Squadron. The Deltas performed at displays around Australia celebrating the RAAF's 50th Anniversary in 1971.

Following postings to Headquarters Williamtown and to No.25 Squadron, where he served as Commanding Officer for two years, Hughie retired from the Air Force on 4 January 1974.

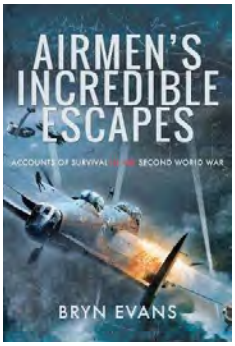
ALEXANDER THOMAS CRAIG

13 February 1922 - 17 January 2021

DURING WORLD WAR II, Alex served in the RAAF as a Fitter Driver Motor Transport in the South West Pacific from 17 May 1944 to 2 March 1949. He had previously served with the Citizens Military Force from 18 April 1942 to 16 May 1944.

Alex joined Bundaberg & District Branch of the RAAF Association on 6 April 1991 and often made the three-hour round trip to attend meetings in Bundaberg until ill health intervened. Eventually he moved to a home in Emu Park where he was closer to family. However, he maintained his membership and interest in the RAAF Association.

The branch was saddened to learn he had passed away, less than a month shy of his 99th birthday.



REVIEW BY Bob Treloar

AIRMEN'S INCREDIBLE ESCAPES: accounts of survival in the Second World War

By **BRYN EVANS**
Pen and Sword Aviation, RRP $75

WHILE ALLIED AIR power made a decisive contribution to victory in the European and Pacific theatres of World War II, the cost in terms of aircraft and aircrew was horrific. RAF Bomber Command suffered a 50 percent casualty rate for its aircrew.

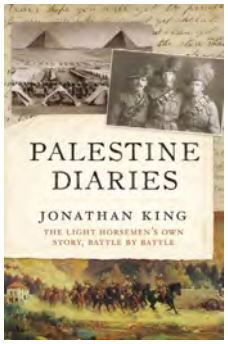
Bryn Evans has drawn together the accounts of British, Commonwealth and American airmen who survived to provide a remarkable insight into the challenges they faced after they were shot down or blown from their aircraft, often shocked and wounded. Each chapter ends with a statement concerning the post-war life of the airman and sadly in many cases, of his recent passing – a reminder that living history is slipping through our fingers

Airmen's Incredible Escapes provides 37 self-contained chapters of individuals and groups of aircrews as they endeavoured to elude a determined enemy intent on their capture.

Commencing with engagements during the phony war – the air war over Burma and New Guinea, through to the intense culmination of the bombing campaign against Germany and German forces in occupied countries, the actions are presented in chronological order.

The experiences of aircrews in Bomber Command provide many of the stories; some 10,000 Australians served with Bomber Command during WWII and 3,486 were killed-in-action – Australia's highest casualty rate of the war.

Airmen's Incredible Escapes is an anthology of human endeavour, individual resourcefulness and the will to survive in situations of extreme adversity.



REVIEW BY Bob Treloar

PALESTINE DIARIES: The Light Horsemen's own story, battle by battle

By **JONATHAN KING**
Scribe Publications, RRP $39.99

PALESTINE DIARIES IS a remarkable account of the Australian Light Horse deployed to the Middle East and the battles it fought from the Sinai to Damascus from 1916 to 1918. It provides a strategic overview of the Middle East campaign and the rationale for it.

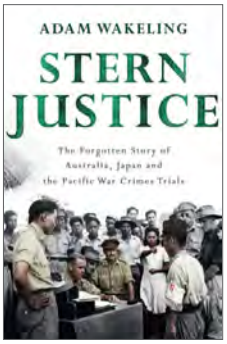
Award-winning historian Dr Jonathan King has been producing books and films about World War I since 1994 and lectured at the University of Melbourne for many years.

Palestine Diaries contains diaries, letters and photos which provide a wonderful insight into troopers' daily routines, their attitudes, fears and aspirations. Told simply with an attitude that is purely Australian, it captures the violence of the battles and records troopers' sentiments.

From the first battle at Romani, the Australian Light Horse proved itself a tough and effective fighting force which helped to expunge the bitter taste experienced when the 8th and 10th Light Horse Regiments were slaughtered at the Nek.

The strong attachment of the troopers to their horses is obvious. The resilience and stamina of those horses is legendary and was instrumental in the success of the Light Horse and ultimately, the success of the Middle East campaign.

History has not accorded the recognition deserved by the Australian Light Horse and this book goes some way to correct that oversight. It is well written, absorbing and highly informative, and will appeal to those readers with an interest in the history of World War I.



REVIEW BY Bob Treloar

STERN JUSTICE: the forgotten story of Australia, Japan and the Pacific war crimes trials

By **ADAM WAKELING**
Penguin Random House, RRP $34.99

THE END OF THE WAR with Japan signalled the commencement of war crimes trials by the Allies. Members of the Japanese Military Forces and the Japanese Cabinet whom the Allies held responsible for committing or sanctioning atrocities against Allied servicemen and members of subjugated populations were put on trial. Much to the chagrin of the Australian Government, the Emperor was not included. The Allies had decided not to try the Emperor, but to use him as a tool to rebuild Japan as a democratic country.

As the wartime atrocities were made known, there was a violent anti-Japanese sentiment in the Australian community. In London, Herbert Evatt, Attorney-General and Minister for External Affairs in the Chifley Government, stated: "in its demand that all Japanese war criminals be brought to trial, the Australian Government is actuated by no spirit of revenge, but by profound feelings of justice".

Australia conducted 249 trials throughout the Asia-Pacific region between November 1946 and April 1951, trying 949 suspects. The trials dealt mainly with crimes against prisoners-of-war, downed aircrew and members of local populations. Of the defendants, 280 were acquitted and 644 convicted – 138 were executed and 498 were sentenced to prison. The acquittal rate of Australian tribunals was 29 percent, the highest of the Allies.

Stern Justice is a most interesting account Australia's role in the conduct of the Japanese war crimes trials and provides a balanced perspective, set within the standards of the time.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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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