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The Air Power Development Centre

The Air Power Development Centre (APDC) was established by the Royal Australian Air Force in August 1989 at the direction of the then Chief of the Air Staff. Originally known as the Air Power Studies Centre, it was renamed the Aerospace Centre in 2000 and then became the Air Power Development Centre in 2004.

Its function is to promote a greater understanding of the proper application of air and space power within the Australian Defence Force and in the wider community. This is being achieved through a variety of methods, including development and revision of indigenous doctrine, the incorporation of that doctrine into all levels of RAAF training, and increasing the level of air and space power awareness across the broadest possible spectrum.

Over the years the APDC has evolved into an agency that provides subject matter expertise for air and space power education, and has a well-developed publication program. Since 1991, the APDC has been responsible for the conduct of the Chief of Air Force Fellowship program in which selected members of the RAAF, and overseas air forces, undertake research in key air and space power issues which have direct relevance and applicability to Air Force.

The RAAF Historical Section was amalgamated with the APDC in 1997, and is now known as the Office of Air Force History.

Comment on these proceedings or inquiry on any other air power related topic is welcome and should be forwarded to:

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Preface

The papers and PowerPoint images contained herein are essentially as they were presented at the conference, with only minor changes to achieve some consistency in layout, spelling and terminology. The transcripts of the panel discussions that followed the presentations have been edited for relevance, clarity and brevity.

Copies of the edited papers and transcripts were sent to the authors for comment and endorsement before publication.

Keith Brent
Editor
Air Power Development Centre
Canberra

April 2012
Notes on Contributors

Air Marshal Geoff Brown, AO

Air Marshal Geoff Brown joined the RAAF in February 1980 after completing an engineering degree. He graduated from No 111 Pilot’s Course in 1981 and was initially posted to No 12 Squadron at Amberley to fly Chinooks. After three years at 12 Squadron he was posted to No 2 Flying Training School, Pearce, and spent 18 months as a flying instructor before being posted to Central Flying School (CFS), East Sale, in 1986. While at CFS, he was a member of the Roulettes from 1987 to 1989. He led the last Macchi team before they transitioned to the PC-9.

In 1990, Air Marshal Brown was posted to Williamtown for a Hornet conversion and then completed a short tour at No 77 Squadron. On promotion to Squadron Leader in 1991, he was posted to No 75 Squadron, Tindal, as a Flight Commander.

In 1993, Air Marshal Brown was then posted to 77 Squadron as Executive Officer. He completed RAAF Staff College in 1995 and was subsequently posted to Headquarters Air Command as Staff Officer Operational Evaluation.

From 1997 to 2000, Air Marshal Brown commanded No 3 Squadron. He then completed F-111 conversion and assumed the position of Officer Commanding No 82 Wing in December 2000. In 2003 he commanded all F/A-18 and C-130 operations in Operation Iraqi Freedom and was appointed a Member of the Order of Australia (AM) and awarded a Legion of Merit for his service in the operation. He was Officer Commanding Airborne Early Warning and Control Systems Program Office from June 2003 until December 2004, and spent 2005 at the Centre for Defence and Strategic Studies. He then commanded Air Combat Group throughout 2006. From January 2007 until June 2008 he was Director General Capability Planning in Air Force Headquarters. Air Marshal Brown was the Deputy Chief of Air Force from 30 June 2008 to 3 July 2011, and was appointed Chief of Air Force from 4 July 2011. He was appointed as an Officer of the Order of Australia (AO) in the 2012 Australia Day Honours List.

Air Marshal Brown has over 5000 hours in military aircraft.

He lives in Canberra with his wife Amanda and his two sons, Ryan and Jake. His sporting interests are gliding and motorsports.
Dr Sanu Kainikara

Dr Sanu Kainikara is the Air Power Strategist at the Air Power Development Centre. He is also a Visiting Fellow at the University of New South Wales. He is the author of eight books: Papers on Air Power (2007), Pathways to Victory (2007), Red Air: Politics in Russian Air Power (2007), Australian Security in the Asian Century (2008), Seven Perennial Challenges to Air Forces (2009), The Art of Air Power: Sun Tzu Revisited (2009), A Fresh Look at Air Power Doctrine (2011) and At the Critical Juncture: The Predicament of Small Air Forces (2011). He is also the contributing editor of the book Friends in High Places: Air Power in Irregular Warfare (2009). He has presented papers at a number of international conferences and published extensively on national security, strategy and air power in various international professional journals.

Prior to his current appointment he was the Deputy Director Wargaming and Doctrine in the Strategy Group of the Department of Defence. He has also taught Aerospace Engineering at the Royal Melbourne Institute of Technology University, Melbourne.

Dr Kainikara is a former fighter pilot of the Indian Air Force who retired as a Wing Commander after 21 years of commissioned service. During his Service career, he has flown nearly 4000 hours on a number of modern fighter aircraft and held various command and staff appointments. He is a Qualified Flying Instructor and a Fighter Combat Leader. He is a graduate of the National Defence Academy, the Defence Services Staff College, and the College of Air Warfare.

He has two Bachelors Degrees, a Masters Degree in Defence and Strategic Studies from the University of Madras, and his PhD in International Politics was awarded by the University of Adelaide.

Mr Michael Molkentin

Michael Molkentin is a PhD candidate at UNSW@ADFA where he is writing a thesis on Australia’s involvement in the 1914–18 air war. His thesis will provide the basis for a volume of the forthcoming Australian Army Centenary History of the Great War series. He is the author of Fire in the Sky: The Australian Flying Corps in the First World War (Allen & Unwin, 2010) and a soon-to-be published history of Charles Kingsford Smith’s 1928 trans-Pacific flight. He has also written on various aspects of Australian history and history education in the Journal of the Australian War Memorial, Teaching History, Cross & Cockade International, Flightpath and Wartime, and worked as a historical consultant for programs featured on the ABC and Channel 9.
Professor John McCarthy

Matriculated from South Brisbane Tutorial Classes, Mature Age Scholarship, University of Queensland. First Class Honours University Medal, Teaching Fellow University of New South Wales, MA in History. Resident Scholar, Australian National University, PhD 1972. Visiting Lecturer University of Wollongong and Senior Lecturer in History at the Faculty of Military Studies, University of New South Wales. Associate Professor in History, University College, University of New South Wales. Deputy Director, Chief of Air Force Fellowships, Air Power Development Centre and, since 2003, Director and then Co-Director of Advanced Air Power Course in distance mode. His work includes the publication of such books as *Australia and Imperial Defence 1918–1939: A Study in Air and Sea Power* (1976), *Australian War Strategy 1939–45: A Documentary History* (1985), and *A Last Call of Empire: Australian Aircrew, Britain and the Empire Air Training Scheme* (1988). He is also the author of numerous articles in academic journals on defence, politics, and foreign policy.

Dr Chris Clark

Dr Chris Clark has been the RAAF Historian since 2004, and heads the Office of Air Force History within the Air Power Development Centre, Canberra. He received his PhD from the University of New South Wales at the Australian Defence Force Academy (ADFA) in 1991, for a thesis on the development of Australian air power between the world wars. He has been a Visiting Fellow (Associate Professor) in the School of Humanities and Social Sciences at ADFA since 2003. Over his career he has served in the Australian Army, conducted policy analysis in the Departments of Defence, Foreign Affairs and Prime Minister & Cabinet, and worked at the Australian National University and Australian War Memorial. Among the more than 20 books on Australian (mainly defence) history that he has published are *The Third Brother: The Royal Australian Air Force 1921–39* (1991) and a volume of official war history covering RAAF involvement in Vietnam 1962–75.

Mr David Gardner, OAM

David Gardner was appointed Curator of the RAAF Museum in 1986. He was appointed Director in 1999, the first civilian Director of the RAAF Museum. During the past 25 years he has taken the Museum from a dusty collection of artefacts, to a world-class aviation museum, showcasing the proud history of the RAAF. This development culminated in 1996 with the opening of the Museum’s Heritage Gallery, which he designed and constructed. The Gallery is now the subject of a refurbishment
designed to include contemporary operations and generate further ongoing interest in the Museum by its many audiences.

Not content with simply preserving the RAAF Historic Collection and developing the Museum displays, Dave has now directed his drive and enthusiasm into developing and implementing a project to construct a large aircraft display facility at the Museum. Dave is currently appointed to several RAAF committees including the Historical Aircraft Support and Loan Agreement Coordinating Committee, the RAAF Heritage Advisory Council and the Management of Static Aircraft Committee. He also is the RAAF's Subject Matter Expert for museums and moveable cultural heritage. He lectures on museum and restoration related subjects to various organisations, including the Army's curatorial studies course. He has served on various heritage associations and committees including Museums Australia National Executive and Museums Australia (Victorian Branch). Dave is an expert examiner under the Protection of Movable Cultural Heritage Act 1986 and an approved valuer under Taxation Incentives for the Arts for aircraft of all periods, engines (aero) and associated documentation, and Australian Flying Corps and Royal Australian Air Force ephemera, medals, uniforms and memorabilia.

Dave holds an Associate Diploma in Aircraft Maintenance Engineering (Airframes), a Graduate Diploma in Museum Management and a Master of Applied Science in Museum Studies. Apart from Service commendations and museum awards, he was awarded the Medal of the Order of Australia (OAM) in 1983 for his services to No 2 Squadron.

**Dr Alan Stephens, OAM**

Alan Stephens is a member of the Williams Foundation, and a visiting fellow at UNSW@ADFA. Previously he has been a lecturer at UNSW, the RAAF historian, an adviser in federal parliament on foreign affairs and defence, and a member of the RAAF. Dr Stephens has published and lectured extensively. In 2008 he was awarded the Medal of the Order of Australia (OAM) for his contribution to Air Force history and to air power strategy.

**Air Commodore Mark Lax, OAM, CSM**

Air Commodore Mark Lax joined the Royal Australian Air Force Academy in January 1974 and graduated dux of his class. After navigator training, he had operational, flight test and instructional tours before completing a number of staff positions. During his career, he was Base Commander of RAAF Base East Sale in Victoria and later, in 1997, RAAF Base Richmond in NSW.
In the following years, Air Commodore Lax held appointments at Glenbrook as Director in charge of plans and future development. He went on to hold a number of posts in Canberra developing higher level policy and defence strategy. These included Director General Policy and Plans, Director General Military Strategy and, in 2006, Director General Strategic Policy in Strategy Division—responsible for strategic assessments, the strategic plans function and a wide range of high level strategy and long term planning documents.

Air Commodore Lax retired from the Permanent Air Force in January 2007 and for two years was managing editor of the *Australian Defence Force Journal*. In 2008, he was appointed to the Defence Honours and Awards Appeals Tribunal where he acts as RAAF specialist adviser for reviews into veterans’ medal claims. Air Commodore Lax also facilitates planning and exercise activities for Customs and Border Protection Command. In 2011, he completed his PhD and was awarded a Medal of the Order of Australia (OAM) in the General Division for his work on military history and support for various veterans’ organisations.

Air Commodore Lax is a graduate of the RAAF Academy, RAAF School of Air Navigation, RAF Cranwell, RAAF Staff College, USAF Air War College and Kennedy School of Government, Harvard University. He enjoys cricket and reading, writing and publishing on military aviation. He is also Vice-President of Canberra Legacy.

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**Air Marshal Errol McCormack, AO (Retd)**

Errol McCormack retired from the Royal Australian Air Force after 39 years service in June 2001. At the time he was Chief of Air Force with the rank of Air Marshal. During his period of service he had commanded at unit, wing and command level, held staff positions in capability development, operations and educational posts, and attended both RAAF and Joint Services Staff Colleges. His overseas postings included flying tours in Vietnam, Thailand, Malaysia and Singapore, an exchange tour with the USAF flying the RF-4C, Air Attaché Washington and Commander Integrated Air Defence System in the Five Power Defence Arrangements between Malaysia, Singapore, UK, New Zealand and Australia.

Since his retirement from the RAAF he has established a company providing consultancy services for multinational companies working with the Australian Department of Defence. He is the Chairman of Chemring Australia Pty Ltd (www.chemring.com.au), a countermeasures and pyrotechnic manufacturing company based in Victoria; a Non-executive Director of Quickstep Holdings (www.quickstep.com.au), a composite manufacturing company based in Western Australia; and consults for Chemring Group PLC and General Electric Military Engines. His pro bono work includes Chairman of the Board of the Williams Foundation (www.williamsfoundation.org.au), an independent think tank supporting development of Australian military
aviation policy. He is a member of the Royal Aeronautical Society and the Australian Institute of Company Directors.

Air Vice-Marshal Kym Osley, AM, CSC

Air Vice-Marshal Osley joined the Air Force in January 1977. After initial aircrew training, he undertook introductory fighter training at RAAF Williamtown in 1982. He flew as a navigator (now air combat officer) in F-111 strike aircraft with No 1 Squadron before being posted on exchange to fly in reconnaissance Phantoms with the USAF in Texas. On return to Australia in 1988, he flew reconnaissance RF-111C aircraft with No 6 Squadron.

In the period 1990–93, Air Vice-Marshal Osley was responsible for major strike reconnaissance projects within Capability Development (Air) Branch. Following staff training in 1994, he was the Air Force strategic planner for three years before taking command of No 1 Squadron (F-111).

On promotion to Group Captain in late 1999, Air Vice-Marshal Osley was posted to the United Kingdom as the Air Force Adviser. In 2002 he undertook senior staff studies before being appointed Officer Commanding No 82 Wing. In August 2004 he was posted on promotion to Director General Capability and Plans, Canberra. In this position he assisted with planning the future force structure for the Australian Defence Force.

Air Vice-Marshal Osley deployed as Director of the Combined Air Operations Centre in the Middle East in the period November 2006 to March 2007. In this position, he directed Coalition air operations over Iraq and Afghanistan. He took up the appointment of Commander Air Combat Group in July 2007. Following studies at Harvard Business School in early 2008, Air Vice-Marshal Osley was promoted to his current rank and appointed as Head of Australian Defence Staff (Washington) in July 2008. In December 2010, Air Vice-Marshal Osley returned to Australia to take up the position of Program Manager New Air Combat Capability (PM NACC).

Air Vice-Marshal Osley is married to Debbie Osley, and they have three sons. He has a Bachelor of Science (Physics) Degree, Master of Arts, Masters Degree in Defence Studies, Graduate Diploma in Management and Graduate Diploma in Military Aviation, and is a graduate of the Harvard Business School (Advanced Management Program). Air Vice-Marshal Osley was awarded a Conspicuous Service Cross (CSC) in 1997 for services to the Air Force and appointed a Member of the Order of Australia (AM) in 2008 for his contribution to Australia’s air combat capability.
## Abbreviations and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
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<tr>
<td>ADF</td>
<td>Australian Defence Force</td>
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<tr>
<td>ADFA</td>
<td>Australian Defence Force Academy</td>
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<tr>
<td>AEW&amp;C</td>
<td>Airborne Early Warning and Control</td>
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<td>AFC</td>
<td>Australian Flying Corps</td>
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<td>AIF</td>
<td>Australian Imperial Force</td>
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<tr>
<td>ANZAM</td>
<td>Australia, New Zealand and Malaya</td>
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<tr>
<td>ANZUS</td>
<td>Australia, New Zealand and the United States</td>
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<tr>
<td>AWM</td>
<td>Australian War Memorial</td>
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<tr>
<td>CAF</td>
<td>Chief of Air Force</td>
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<td>CAS</td>
<td>Chief of the Air Staff</td>
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<td>CDF</td>
<td>Chief of the Defence Force</td>
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<td>CFS</td>
<td>Central Flying School</td>
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<td>CGS</td>
<td>Chief of the General Staff</td>
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<td>DFC</td>
<td>Distinguished Flying Cross</td>
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<td>DRP</td>
<td>Defence Reform Program</td>
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<td>DSTO</td>
<td>Defence Science and Technology Organisation</td>
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<td>IOC</td>
<td>Initial Operational Capability</td>
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<tr>
<td>JASSM</td>
<td>Joint Air-to-Surface Stand-off Missile</td>
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<td>JSF</td>
<td>Joint Strike Fighter</td>
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<tr>
<td>NAA</td>
<td>National Archives of Australia</td>
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<td>NATO</td>
<td>North Atlantic Treaty Organization</td>
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<td>NSWSR</td>
<td>New South Wales State Records Office</td>
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<td>RAAF</td>
<td>Royal Australian Air Force</td>
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<td>RAF</td>
<td>Royal Air Force</td>
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<td>RFC</td>
<td>Royal Flying Corps</td>
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<td>RNAS</td>
<td>Royal Naval Air Service</td>
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<td>SEATO</td>
<td>South-East Asia Treaty Organisation</td>
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<td>Acronym</td>
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<td>UN</td>
<td>United Nations</td>
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<td>USAAF</td>
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Introducing and Opening Remarks

Dr Chris Clark

Chief of Air Force, Air Marshal Brown, former Chiefs and senior leaders of the RAAF here present today, distinguished guests, men and women of the RAAF—past, present and future—ladies and gentlemen, welcome to the RAAF History Conference for 2011.

As I expect virtually everyone here will be aware, 2011 marks the 90th anniversary of the formation of the Royal Australian Air Force, and this most important step in the history of the Service has been commemorated by a range of events over the course of the year celebrating the theme of 'tradition, innovation and evolution'. Today's conference will be the last major event marking the 90th anniversary, and it provides an appropriate opportunity to reflect on how the Air Force has evolved over that period, how it has adapted to meet the constantly changing circumstances in which it has operated, and perhaps take a glimpse at what the future might hold for the RAAF.

History conferences may be thought to be a bit out of favour in the present climate, where the emphasis is on making financial savings under the Strategic Reform Program, but there are definite arguments for holding such events in terms of educating the RAAF's work force and providing a better understanding of the job that Air Force does in helping to defend the nation. A few years ago Air Force Headquarters sponsored the holding of a series of focus groups to find out what currently serving members thought about their Air Force, and what they would like to see that would enhance their Service experience. One of the surprises that came out of that exercise was a call for 'more history please'. Members wanted to know more about the organisation they had joined, what it had achieved and what it stood for.

The presence of so many in this place today is a clear indication that the thirst to know more about the RAAF and its past experiences is alive and well. I hope and trust that the program we have put together goes a substantial way towards realising the expectations that we do not doubt exist. I especially want to thank Air Marshal Brown for giving his approval when the proposal for this event was put to him, and then thank you all for the support that your presence today gives to the idea that there continues to be a place for events such as this. I also would like to acknowledge the hard work of the team within the Air Power Development Centre which has made today's event possible, in particular Sandra di Guglielmo, the Deputy Director for Engagement and Coordination, who has borne the brunt of organising it.

Well, this month 90 years ago, virtually the entire strength of the new air service—officers and airmen—was engaged in non-technical training (saluting, marching, that sort of thing) at the Army’s Central Training Depot at Holsworthy, just outside the Sydney suburb of Liverpool. Although practically all members of the RAAF had seen active service in World War 1, with the end of the war already nearly three years old
it was felt that a bit of refresher training in basic military skills was in order. No 1 Air Force Course, comprising 22 officers and 145 airmen, had begun what was expected to be four months of training in mid-September. They were joined by a second detachment of 10 officers and 74 airmen on 7 November, so that almost the entire strength of the RAAF back in 1921 was at Liverpool until mid-December, when the training was wound up and everyone proceeded on Christmas leave. Until personnel reported back for duty in January 1922, the sole Air Force base at Point Cook, Victoria, stood deserted except for a small maintenance party.

It was from this sort of clean slate to start with that the RAAF has gone on to shape itself into one of the most capable small air forces in the world. Over the course of today’s presentations, we can expect to learn what were the problems associated with that development and evolution, together with some of the high and low points along the way. Ideally, I would have liked to reinforce this thought by citing some notable event in RAAF history that coincided with the date of today’s conference, but it seems incredible to have to say that, according to the ‘On This Day in RAAF History’ database that the Office of Air Force History maintains, it appears that nothing worthy of special mention occurred on 4 November throughout the RAAF’s 90 years! So there is a challenge I would like to throw out to everyone here today: if you can think of a notable event from the past to record against today’s date, please mention it to any of the APDC staff members who are circulating around the place, or email us.

Speaking of the Office of Air Force History database of dates and events, you will find in your conference bag a flyer for a new publication called 90 Years of the RAAF: A Snapshot History. This book presents a selection of entries contained in the same database, only organised to highlight the calendar years in which events took place. It had been hoped to have the book available to launch here today, but production delays made this impossible. It will now be separately launched on a date in late November. The flyer you have received gives you the chance to pre-order, at a discounted price, both that book and the next in the series of Heritage Award publications—that being the winner of the 2010 Heritage Award, Lost Without Trace by Leon Kane-Maguire. If you would like to obtain additional copies, as Christmas gifts perhaps, you can also use the flyer provided to purchase these in advance.

I would now like to invite Air Marshal Geoff Brown, Chief of Air Force, to give his keynote address.
Distinguished guests, ladies and gentlemen, welcome to the 2011 RAAF History Conference. This is the fourteenth Air Force History Conference since their inception in 1992. However, it is three years since we have held one—the last one was in 2008—so I think it is very appropriate that we hold this one on our 90th anniversary.

Why is history important? If I was to quote Shakespeare, he would say, ‘What’s past is prologue’; it is an important foundation for the future. I like another one from Mark Twain which is, to paraphrase him, ‘While history doesn’t repeat itself, it sure as hell rhymes.’ So there is a certain level of importance to history and we should recognise this. I would like to begin with why history is a good pointer to the future, and one of the statements I will make is that common sense, or whatever you think at a particular point in time, will be fundamentally wrong when you look back in hindsight 20 years later. Normally, the prevailing political wisdom of what the future will look like will inevitably be wrong. I will paraphrase George Friedman, who does an intelligence text called Stratfor which I get every day,1 and he actually illustrates this point by taking a series of 20-year cuts through the 20th century to show how wrong you are when you sit at any point in time and look to the future.

It is also interesting if you take the last 100 odd years; that is the entire time that we have been aviating. So if we go back and you imagine yourself in 1900 in London—and just imagine the Wright brothers have not flown at this stage—and you looked across the world at that time. Europe pretty much ruled the world; if they did not rule it, European capitals certainly influenced every part of the world. Also at that point you could say that everybody was pretty well interconnected. Nobody could envisage a war lasting any more than two or three weeks because everybody thought that there would be too much financial strain on the markets and there were large European empires. You only have to go 20 years forward and you have had millions of people killed in a four-year war, and all of the empires—the Austro-Hungarian Empire, the Ottoman Empire—are in tatters. The Americans have come in with a force of a million men and all of a sudden they have become a power, and Japan is actually on the rise at that stage. But in 1920, you are really sure of one thing: that peace treaty you have got with Germany means that they will never rise again. Of course, you only have to go forward 20 years to 1940 and have a look at what happened.

If I go back to 1920, if you relate it to aircraft, all of a sudden the aircraft has emerged as a weapon of war. We roll forward to 1940 and Germany has actually defeated France

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1 Stratfor is a subscription-based provider of geopolitical analysis, see http://www.stratfor.com, accessed 1 March 2012.
and dominates Europe, and Russia and Germany have a pact together. If you are sitting in Britain in the summer of 1940, life looks pretty grim—it might not be a ‘Thousand Year Reich’ but you can imagine that the Germans are going to dominate for a little while longer. Of course, at that stage, the aircraft is starting to emerge as the critical weapon of war because if you do not have air superiority, you are not going to manage to do anything with ships or on the ground.

Roll forward to 1960 and you find Germany was defeated within five years—that was not something you could imagine in 1940—Europe is divided, basically right down the middle, and you have got that competition between the US and the Soviet Union in 1960. You have got to stage where America’s nuclear domination is such that the Soviet Union is pretty much surrounded. If you look at the Chinese in 1960, you think that they might be a bit of a threat because they have got that fanatical Maoist regime. And, of course, the only way the Soviets can do anything is probably invade Europe through the Fulda Gap, and so that is what everybody practises for the next 15 years.

If we roll forward to 1980, things have changed quite a bit. America has actually been defeated in a war, not with the Soviet Union but with North Vietnam which is a communist nation, and they have been tossed out of the oil fields in Iran—it looks as though the Soviets are going to dominate that area. In many ways America actually feels in retreat, and the world sees them in retreat at that stage.

If we think about aircraft again, in the 1960s we had aircraft where we were looking for speed—Mach 2 was the thing. We were looking at interceptors; you did not need to turn, missiles were the go. If we roll forward to 1980, as far as air domination is concerned, we are back to looking at aircraft that need to turn. So, we are sitting there in 1980 and just roll forward 20 years to 2000 and the Soviet Union has collapsed, America is the sole superpower and the world looks pretty peaceful and prosperous. The only things anybody can envisage are conflicts in Haiti and Kosovo and general regional conflicts, and then one year later we have September 11 and, guess what, we have been at war for 11 years. Anybody who sits here in 2011 and can tell you what it is going to look like in 2020 has got ‘rocks in their head’, and from an air force point of view we need to keep that in mind. So that is why it is important to look at history.

If we have a look at our region, and I think that is the other thing that we also have to take into consideration in terms of air power, for the last 60 years this region has been at peace. It has gone through a fairly rapid economic development and that economic development has been fundamentally underpinned by the US domination of the Pacific. The US Navy’s domination of the sea lines of communication has allowed a very peaceful development in that area. The future is always determined by your history, your geography and your culture.

If I look forward into the future, what do I see? I see a China that is well and truly on a very rapid rise, I see an India that is on a rapid rise. Both those countries are ancient civilisations that are looking for their place in the world. The US certainly has no intention of going anywhere from the Pacific. If you look at what they have got, they have half their F-22 squadrons in the Pacific, they are hardening Guam at the moment.
and they have got a nuclear aircraft carrier now in Japan. They have no intention of changing where they are going. As we look into the future, however, there are a lot of areas for strategic miscalculation on a number of issues over the next 10 to 15 years and we need to be ready for that.

This next slide is an interesting set of 50-year cuts showing resource consumption and what is going on. I always worry about curves like these because, if you see them in financial markets, you know at some point there is going to be a discontinuity. We have seven billion people in the world at the moment and there are about two billion of them that are aspiring to a lifestyle that we actually enjoy at present. If we are going to maintain that lifestyle, we need to get our resource consumption down to about 20 per cent of what it is at the moment. We are in a situation of fundamental and accelerating change. I would just point out for anyone who thinks there is going to be a continuity of our current situation that we need to take some of these things into consideration.

I like Al Stephens’ quote:

“The era has gone in which predominantly white, predominantly European, predominantly Christian armies could stampede around the world invading countries their governments don’t like or want to change ...”

After the last 10 years I think we need to learn the lesson that ground campaigns are incredibly costly and incredibly complex, and I am not sure that the West is in a position to execute too many more from here on in. I would just take Libya as a classic example of that change in mindset. The lessons from the Libyan campaign were, firstly, once you put air over the top and you do control the air, the guys on the ground, even if they are in Toyota HiAces, will not get defeated no matter what armour the other guy has got. The other issue out of Libya is that, if you look at that campaign, any half-decent army probably could have cleaned up the Libyan forces in about two weeks but the Europeans chose not to do that. They chose not to do that because the lesson we have taken out of Iraq and Afghanistan is that the human terrain, once you put people on the ground, is an incredibly complex situation. It is not easy and, certainly, if you come in with a different culture, it is an incredibly difficult and complex campaign.

If you look at some of the lessons out of Iraq, Iraq was contained basically with Operations Southern Watch and Northern Watch. The cost of that was about a billion dollars a year—a pretty expensive undertaking. As soon as we put ‘boots on the ground’ that cost went to in excess of $12 billion a year. That is just a comparison of the strategic choices that governments might make.

So what does an air force bring to the joint fight? Something that it has always brought to the joint fight, in my opinion, is that we only do four things, and we have been doing those four fundamental things since World War I. We move things through the air; we observe things from the air, whether they be on the ground or the sea; we affect things on the ground and on the sea, from the air; but the most fundamental thing is that we
actually control that air domain because if we do not control that air domain nothing actually moves in the land and maritime domains.

As shown on the slide, there is another player in here at the moment—cyberspace. We have become so networked and so dependent on our IT (information technology) systems that the other piece of superiority that we have to get is in cyberspace. We actually need to secure our networks; otherwise we will be in trouble even trying to get that air superiority. The slide also shows the space circle and I will just leave you with the following thought. Before World War I, the air was uncontested observation space. Once we got into a conflict, it did not take long before it became very contested. Space is a ‘free good’ to everybody at the moment. I think in the future one of the areas that Air Force has got to get into is to be able to find, fix and track what is in space because we will need to be able to affect that so we can do all the jobs that we need to do.

What endures about an air force? This is a history conference but I would argue that the following factors are characteristically essential advantages for an air force:

- **Speed** - rapid response
- **Long Range**
- **Not limited by terrain**
- **Precision effects**
- **Capabilities of strategic weight**

**Speed.** We have really had this from the start and now we are up around 6 or 7 nautical miles a minute as a standard. Organisational speed is the other thing that we have. I have a standing joke with the Chief of Army; I say that we have actually launched the aircraft before you have got the commander’s intent in the Joint Military Appreciation Process (JMAP) half the time. And I only say that half-jokingly, because it is true. I can give you some classic recent examples of this. The first we knew that we had to evacuate patients from Cairns Hospital during Cyclone Yasi was when Premier Bligh actually announced it on the news—no other communication had gone on other than that. Those aircraft were actually up there, with aeromedical evacuation (AME) teams, in less than three hours. We can and do respond very quickly. I was talking to André Deschamps, the Chief of the Canadian Air Force, about a month and a half ago and in the Libyan campaign he had actually launched his Hornets to Europe with no idea of where their final basing was—they worked that out during the Atlantic transit. They knew exactly where the refuelling base was and they were prepared to launch the team and get it there without having negotiated the final basing. So, speed is an essential advantage of an air force and it has been historically and is something on which we need to continue to focus.

**Long Range.** Long range, of course, and I think finally from an Air Force point of view, with the air-to-air refuellers that we have now and will have in the next six months, we can basically fly globally with any of the capabilities that we have got; that will certainly be the case in the next 12 months.
Terrain. We are not limited by terrain and, increasingly, not limited by weather either these days.

Precision Effects. In World War II you had 1000-bomber raids on one target. These days with the aircraft we have, you are looking at one aircraft and at least four targets, most of the time, with GPS-enabled weapons.

Strategic Weight. I think the other key thing is that we carry a lot of capabilities of strategic weight. The classic capability of strategic weight for the last 40 years within the Air Force has been the F-111. The mythology around that aircraft often exceeded its capability but it certainly was a true strategic weight capability. I understand Mark Lax is giving a presentation later on today on what a fundamental change the F-111 was for the Air Force. These days, we are about to achieve Initial Operational Capability (IOC) on a Joint Air-to-Surface Stand-off Missile (JASSM)—that missile has got about a 500-kilometre range and it is a stealth missile. This means that now we have probably got a much better capability than we ever had with the F-111, in that I can stand off and threaten any target from 500 kilometres and there is not much that anybody can do about actually stopping that weapons system. The other capability of strategic weight that we have is the C-17 and in the humanitarian assistance and disaster relief (HADR) role it actually has foreign policy effects. Following the tsunami in Japan, we had one aircraft over there for two weeks with two crews and it lifted 25 per cent of the loads that were moved around Japan at that time—it provided a very flexible approach. In fact, at one stage in two C-17 loads we lifted some water cannons that were used to spray water on the nuclear reactors. The Chief of the Japan Air Self-Defense Force (JASDF) actually has on his desk a photo of our C-17s, taken at Yokota Air Base.

I do not say that the Air Force has got exclusivity on these things but these are the essential advantages that an air force brings to a joint fight and something we should remember.

We are going through an enormous transition in the Air Force at the moment but it is not the only transition that we have had over the last 90 years. I would argue that we have gone through three major transitions in the Air Force’s history. The first one was 1939 to 1945, and it is great to see some gentlemen in the room who were around in those days. The Air Force started with 3200 people and less than 210 aircraft and by the end of World War II we had 215 000 people and 6000 aircraft, and we were the fourth largest air force in the world—a pretty amazing transformation when you look at it. I would argue that we had another major transformation between 1953 and 1973. We went from Sabres to Mirages, we went from piston-engined Lincolns to F-111s and we went from Dakotas to C-130s, as well as a lot of other capabilities.

At the RAAF’s 50 anniversary, Sir Colin Hannah, who was then Chief of the Air Staff, made a couple of statements about that period. The first one was about the increasing complexity of the aircraft that the Air Force was operating at that time. But I think his second point was probably the most important. During that time, 1958 to 1973, there was a high operational tempo and Sir Colin put forward the view that ‘the success of
the Air Force was due to the unflagging efforts, dedication to duty and gallantry of a well-trained, highly skilled and well-equipped professional force.

I look at the scale on which we are operating today. A lot of our groups have been on operations for about eight years now and some of our people have been deployed eight plus times to the Middle East.

It is a fairly large task and it is a fairly comprehensive transformation. The Air Force has always produced world-class aircrew, and I am sure we will continue to do that, but at its heart an air force is a complex engineering and logistics support organisation, and the quality of that support actually determines the quality of the organisation. Having said that, we are actually not doing too badly.

The last 12 months has seen new capabilities:

Super Hornet. You saw a bit of an illustration of the fact that we actually had 23 Super Hornets serviceable last week and we flew 21 of them. That project has been ahead of schedule and under budget by about $500 million—so a pretty successful project.

Heron. We went direct into the Middle East with Heron, probably in less than 90 days from the operational requirement going out. It now produces 6000 hours of overhead time in Afghanistan and it flies 22-hour missions. We still do not have a permanent squadron. The way we do it is we get a bunch of fighter pilots and P-3 ‘drivers’ and throw them together. We then give them a quick course on the Heron and throw them into the Middle East and they get up to speed very quickly. The Heron is a great capability for the Afghanistan theatre.

Wedgetail. Wedgetail cops a bit of criticism as a project but it is very close to IOC—I think we should achieve it within the next few months. We are down just to a checklist of issues that we have to go through. It is a truly transformational capability for the Air Force.

King Air. Even though it is a small, simple aircraft, the King Air was still a transition from the Caribou. We do have a capability gap and we are working hard on that.

Vigilare. Vigilare has been declared IOC. For any of you who get to view that capability, I think you will be pretty amazed at the sort of integration and ability that we have got to actually find, fix and track in airspace in Australia and to the north of us—truly groundbreaking capabilities.

We will have three tankers by the end of the year. There are some challenges in the tanker area but I think we will work through those. And then there is JASSM. As I said, the combination of the F/A-18 with JASSM gives us back that long-range strike capability, and a better long-range strike capability than we ever had with the F-111.

5th Generation. We need to move to this capability. I am fairly confident with where that project is at the moment. Again, it gets a fair bit of bad press but it is pretty much on its test points. If you look at what is coming into the region, with PAK FA and
possibly J-20, the Super Hornet is a great aircraft for the moment and probably out to about 2020–2025 but it will not be a great aircraft post that; it will be uncompetitive and as George Kenney said, ‘Having the second-best air force is like having the second-best hand of poker – it gets you nothing yet costs you money’. We need to be on the leading edge if we are going to maintain that air superiority.

So what are our Air Force priorities?

People are the key to capability. Sir Colin Hannah said it 40 years ago; it is exactly the same message 40 years later. We need to continue to invest in training and skilling. We need the right mix of skills to support our new capabilities and this is an area that is going to challenge us. Our aircraft have got to the point where they need a lot more force protection than we previously have had because of the security classification of them. And every aircraft that we are getting is a highly ISR-capable platform, so there is a lot more need for that technical intelligence capability than we have ever had before. We are doing pretty well in the SRP (Strategic Reform Program) area. I will not bore you with any examples of that other than to say that there is a great groundswell of innovation occurring out there that is lowering our cost of doing business and doing it pretty well.

We work in a fairly complex scenario in Defence these days. I no longer own the bases; we are a tenant on our bases. I have another organisation that does my sustainment and another one that does my capability development. I am not sure if you had a clean sheet of paper that you would actually put an organisational construct like this together. However, you face reality as it is and those relationships with our other Defence Groups are actually key to capability because when I talk about ‘one team’ in Air Force, I talk about not only our Permanent Air Force but also our Reserves, our public service and also the contractors that work for Air Force—they are all part of the team. Communications, both internally and externally, are always a struggle. The last point is that Air Force has a solid reputation and I think it is important that we maintain that.

I have put this next slide up as the key to success in any organisation. All the business models in the world do not transcend that statement. As a Chief, I feel particularly lucky and privileged that our workforce is very much in that space. I strongly believe that we are one of the most capable air forces in the world and certainly the best in the region. No other air force in the region has our balance of combat experience or the balance of capabilities we are getting over the next 10 years.

So, with that, I am very pleased to open the fourteenth RAAF History Conference—Evolving the Air Force: 90 years of the RAAF.

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2 The PAK FA and J-20 are 5th-generation fighters being developed for the Russian Air Force and the Chinese People’s Liberation Army Air Force (PLAAF) respectively.
The Search for an Air Strategy for Australia

Dr Sanu Kainikara

There are two compelling reasons to investigate the development of an Australian air strategy. First is that the Royal Australian Air Force, the repository of Australia’s air power capabilities, is the second oldest air force in the world and has been in the vanguard of the nation’s security posture since its inception. Therefore, a study of the development of its air strategy would have more than academic value to understanding the broader contribution of a small air force to national security. The second, and perhaps an even more compelling reason, is the impact of geography on a nation’s security perceptions and the direct link it has to the development of air power capabilities. Australia is a large island situated at a distance from other nations. At the risk of sounding blasé, I would say that the term ‘tyranny of distance’ was aptly coined and applied to Australia. Until air power arrived on the scene, geography empowered Australia, if it so desired, to stay in splendid isolation from the rest of the world without fear of any dramatic challenge to its security. Air power changed this idyllic condition and in this context it is noteworthy that the only two direct attacks on mainland Australia in its history had air power connections—the submarine raid on Sydney was preceded by air reconnaissance and the attack on Darwin emanated from the air.

So how does one trace the development of Australia’s air strategy? In such an endeavour it is always a good idea to draw a thread of continuity, or disruption, from the beginning to the present. In the next 25 minutes or so I will endeavour to pick the salient points of the development of air power strategies in Australia over the past 100 years and analyse the commonalities that provide an insight into the path that was taken to reach the current position.

The Beginning

In 1914, Australia created the Australian Flying Corps (AFC), the first to do so among Britain’s Dominions, and by the middle of that year had commenced flying training of the first set of military pilots at the newly established Central Flying School. This made it possible for Australia to contemplate actual air operations at the outbreak of World War I. In late November 1914 an infantry battalion was detailed to deal with an armed enemy base reported to be located on the Sepik River, in the German territory of New Guinea. Two aircraft along with two pilots and four mechanics were also embarked on the troopship. In the event, the enemy base was found to be a fiction and the vessel returned to Australia from Madang. Though this attempt to lay the foundational
tradition of Australia’s fledgling air corps proved abortive, almost immediately another opportunity arose.

In February 1915, a request was received from the Indian Government for aerial assistance in a planned campaign in Mesopotamia, modern Iraq.1 The Australian Government dispatched what came to be known as the Half Flight, AFC from Melbourne on 20 April. This was the first operation undertaken by Australian air power with four officers and 41 other ranks serving in the disastrous Mesopotamian campaign of 1915–16. The deployed nature of this commitment laid the foundation for the development of an expeditionary strategy that became, and continues to be, the foundation of Australia’s air strategy.

By 1917, the AFC had expanded to four front-line squadrons and also set up a training wing of four squadrons. Providing aviators for overseas service was the second development which continued to influence Australian air power thinking for the next four decades. Australia’s contribution to the air war during World War I was relatively modest. However, the fundamental importance of the AFC is that it existed as an embryo national air force, distinctly Australian and different from the much larger British force within whose structure it operated. This separate identity provided Australian airmen with early command experience; a clear understanding of the transformation of the traditional battlefield and the dynamic changes in the conduct of war being brought about as a result of the advent of air power.

The Inter-War Years

Even before the end of World War I, strategic thinking in Australia had begun to focus on incorporating aviation as a permanent component of the military forces. Both the Army and Navy evolved schemes to establish separate air services, which led to inter-Service wrangling for the control of the air component. The establishment and work of the Air Service Committee, the quest for control and the decision to establish an ‘Air Force, separate from both Naval and Military Forces’ all make interesting and at times entertaining reading. Although these developments are not material to this discussion, one important factor must be mentioned. Even though the Defence Department was firmly committed to establishing an Australian Air Force, the necessary financial outlay was not forthcoming from a government reluctant to spend further on defence in the immediate aftermath of an expensive and long-drawn war.2 However, the Government was keen to establish airmail services in some of the nation’s more remote regions. This desire provided the necessary impetus for the Government to approve the establishment of an Air Force and the start of an experimental airmail service. The independent Australian Air Force came into being on 31 March 1921. The

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2 ibid, p. 29.
establishment of the force was indelibly connected to it being able to provide a non-
military service to the civilian society, a trend that continues to be a hallmark of the
RAAF and forms an integral part of its air strategy.

The Salmond Report. On 21 April 1925, the Chief of the Air Staff (CAS), then Group
Captain Richard Williams, submitted a proposal titled ‘Memorandum regarding the
Air Defence of Australia’ to the Government that predominantly argued for a nine-
year program that would increase RAAF strength to 18 squadrons and 12 flights. This
paper can also be considered the first attempt at articulating the air force approach
to Australian defence. To support this memo, Williams acted on a proposal by Sir
Hugh Trenchard, the British Chief of Air Staff, and invited a senior RAF officer to visit
Australia to provide an opinion on the Air Force. Air Marshal Sir John Salmond arrived
on 26 June 1928 and submitted a two-part report on 20 September before departing
for New Zealand. The report, at least the public half, was far from flattering with the
force being described as unfit for war and cataloguing a number of deficiencies.3

Analysing this period in the history of the RAAF, it now seems surprising that the
Service survived as an independent entity, especially since it lacked a clearly articulated
strategic rationale for its existence. However, Salmond’s proposals for a moderate
expansion were welcomed, even though the Depression barely a year later caused it
to be shelved. The Salmond report formed the basis for the rebuilding of the Air Force
from 1934 onwards.

During the inter-war years, the defence of Australia was enduringly connected to
the strategy of Imperial defence. Within the nation there were both supporters and
detractors of air power. However, support and opposition to air power was based not
on any clear strategy for its employment, but mostly to further political beliefs. For
example, the nationalist Australian Natives Association passed a resolution in March
1921 during their Jubilee Conference that ‘the development of aircraft is of supreme
importance to Australia as the most effective and economical means of defence’.4 This
was not a considered opinion regarding national security, but an effort to weaken
Australia’s links to the strategy of Imperial defence through developing Australian self-
sufficiency. In fact, John Curtin, even before he became the Prime Minister, opposed
the Singapore strategy based on sea power and proposed the use of air power as an
alternative. Notwithstanding the political slant of some of these pronouncements, it
must be added here that there was support for the concept of the Air Force becoming
Australia’s first line of defence. Further, in an oblique manner, these opinions could
also be construed as early symbols of the quest for independence in matters of
national security. However, this debate did not influence any decision of the Australian
Government regarding defence or national security.

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3 ibid, pp. 98–99.
4 The Sydney Morning Herald, 9 March 1921, as quoted in John McCarthy, Australia and Imperial
Defence 1918–1939: A Study in Air and Sea Power, University of Queensland Press, St Lucia,
1976, p. 23.
A decade after the Salmond visit, the Australian Government invited the Inspector-General of the RAF, and later Marshal of the RAF Sir Edward Ellington, to report on the state of the Air Force. Ellington reiterated the British position that Australia and its defence forces must support the Singapore strategy. The only notable outcome of this visit and the subsequent report was that Williams who had by then been the Chief of the Air Staff in different ranks for 17 years was sent on exchange to the RAF for two years. Ever since, there has been speculation whether or not this move was generated through personality clashes and animosity.

Around the same time, there was ongoing debate regarding the survivability of capital ships against concerted air attacks. With a finite budget to allocate between the three Services with conflicting claims, the Australian Government analysed this issue carefully. However, the Imperial system of defence and the Singapore strategy, the cornerstones of Australian defence policy, were fundamentally based on sea power, with air power considered a support capability, if at all.\(^5\) In this overarching Imperial system, air power remained in a state of limbo devoid of any clearly defined role or function. The RAAF was meant to provide an air garrison for the defence of Singapore, which it did in 1940.

From its inception as an independent Service in 1921 till about 1932 there were constant attempts to subordinate the Royal Australian Air Force to the Army and the Navy, with both these Services regarding aircraft merely as adjuncts to their operational needs. There is sufficient evidence to prove that the Air Force was in a precarious position for the first 11 years of its existence. The Chief of the Air Staff, Group Captain (later Air Commodore) Williams, had to spend almost all his time in arguing the case for retaining an independent air force with autonomous finances and administration. It is, therefore, not surprising that during this period very little thought was given to the development of a viable air strategy for the defence of Australia. Further, the central concept of Australian defence policy during this period was dominated by the Singapore strategy within the Imperial system of defence, which reduced both the Army and the Air Force to secondary status, being considered necessary only to deal with local defence contingencies.\(^6\)

**World War II**

World War II was both a boon and a curse to the Royal Australian Air Force. As early as 30 September 1939, Mr James Fairbairn, the then Minister for Civil Aviation and later Minister for Air, declared that ‘victory in this war will depend upon mastery in

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\(^6\) Coulthard-Clark, *The Third Brother*, p. 96.
Subsequently, Prime Minister John Curtin, who assumed power in October 1941 for the remainder of the war, described World War II as the war in which ‘air superiority almost dictates the nature of military and naval operations’ and suggested that without air support ‘naval strength is virtually impotent’ and Army operations without an adequate air force were likely to be ‘greatly prejudiced and frustrated’. With this unequivocal support, Australian air power developed with dramatic speed. This was the boon. But what about the curse that I alluded to? There were two that stand out, even at this distant time.

First, by any yardstick, the Royal Australian Air Force performed with extreme credibility at the operational level throughout World War II in all theatres. However, such operational excellence was very slow in being transformed to a holistic understanding of air power at the strategic level for a number of reasons. First, the higher echelon command of almost all Australian units in the European theatre rested with senior RAF officers. In the Pacific theatre, although Air Vice-Marshal Bostock was given independent command of all Australian air units and was the air commander for a series of operations, the exposure for the force as a whole to strategic command was limited. The outcome was that the RAAF remained operationally oriented with almost no opportunity to consider strategic level challenges. It is understandable that a junior partner in an alliance is unlikely to be given strategic command. However, I also believe that the total lack of RAAF officers in senior leadership positions was also a result of Imperial hubris and the British insensitivity to the needs and aspirations of its Dominions.

Second, the Empire Air Training Scheme robbed Australia of what could have been the defining identity of the RAAF by amalgamating and spreading Australian aircrew across the RAF, with RAAF aircrew serving in over 200 RAF squadrons by the end of the war. The command and control arrangements were such that there was no opportunity to develop the RAAF into an instrument of war of national significance. Given the reduced visibility of the RAAF in Europe and the lesser priority given to the South-West Pacific theatre, the RAAF remained, as Dr Alan Stephens has so eloquently stated, ‘the second eleven’.

Hindsight is a great thing. After nearly 70 years it is seen that there was ineptness in terms of behaviour on the part of the senior RAAF leadership. There is no doubt that the RAAF’s war effort in the Pacific theatre was adversely affected by the lack of goodwill and cooperation that prevailed between the two most senior RAAF officers. In the end, the RAAF was not part of the main body of the air force that was instrumental in the defeat of Japan. It will not be an exaggeration to state that the

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RAAF struggled at the political and intellectual levels of the war.\(^9\) Obviously there was no air power strategy that could be labelled ‘Australian’ during this period.

Without going into historical details, suffice it to say that there are still some lingering disappointments over the employment of the RAAF in World War II, particularly in the South-West Pacific Area (SWPA)—Australia’s primary area of operations. The fact remained that by the end of the war the RAAF had become a large and operationally competent force staffed by combat-experienced commanders and crews, equipped with large numbers of modern aircraft, supported by a vast infrastructure and capable across the full range of air operations.\(^10\) However, strategic thinking at the highest levels of its leadership remained a chink in the armour.

**Postwar Years**

Immediately following World War II the RAAF demobilised and earnestly set to delineating its strategy for the air defence of Australia. At this juncture nuclear strike capability was touted as an obvious advantage to a small nation as well as a deterrent capability. Therefore, it was only natural that the nuclear issue would be examined. There was also a concurrent debate regarding the delivery platforms—manned bombers or missiles—which tended to cloud the development of adequate air power strategy. While this was a worldwide phenomenon at that time, the ultimate outcome for the RAAF was that it continued to be on uncertain intellectual ground, with no articulated strategy.

Traditionally Australia’s Defence Forces have been structured for two primary roles—to provide protection for the mainland from relatively small-scale attacks with a minimal level of self-sufficiency, and to contribute to collective security in partnership with a larger ally by providing expeditionary forces for overseas service. Although not defined as such, a judiciously balanced mix of forward defence and limited local defence has been the foundation for Australia’s defence strategy since the 1930s. This is a sensible strategy for a nation such as Australia, which is geographically isolated, has a relatively small economy but enjoys a high standard of living, does not have a sizeable population to sustain a large military force and is yet cognisant of strategic uncertainties that would directly affect its security stance. The imperative to maintain a forward defence was re-emphasised during World War II when loss of control of the sea following the fall of Singapore placed Australia at risk. Accordingly, in the immediate postwar planning, the Air Force was earmarked to take the leading role in forward defence as a Mobile Task Force.

This was a logical step for two reasons. First, with its demonstrated speed, range, flexibility and strike power, the Air Force was better suited to provide the Government

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\(^10\) ibid, p. 83.
with a force structure that could do the dual roles envisaged for the ADF. Second, for a nation that had a remarkably low population, it was a sound decision to reinforce with technology the lack of manpower, especially when air power had demonstrated that the predictions of air power theorists seemed to be largely achievable.\textsuperscript{11}

From a strategic perspective, the years immediately after World War II were similar to the early 1920s—the Air Force had the best chance to promote air power as a primary capability in the defence of Australia. However, the RAAF missed the opportunity to establish a truly independent and indigenous intellectual foundation for the employment of air power to meet Australia’s unique security requirements. It merely endorsed the USAAF position put forward by its Commander, General Hap Arnold. Needless to say, then as now, the US view of air power did not and will not automatically fit the RAAF framework.

Notwithstanding the strategic pragmatism that made Australian defence planners and strategists link their security interests with those of the United States, the development of a forward defence policy was an expedient and practical way to secure an island nation. There is no better way to ensure the security of an island, any island, than to control all approaches to it as far away from the mainland as possible. It is therefore not surprising that post–World War II Australia’s defence strategy has been fundamentally underpinned by this paradigm. The variations within this basic theme in the past 50 years or so have only been in the methodology embraced to achieve this cardinal objective.

The ADF acknowledged the importance of technological progress but, in actuality, the strength of the RAAF had been whittled down to just 13 squadrons in less than two years after the end of World War II. There was a clear dichotomy between creating an intellectually credible RAAF strategy to execute forward defence and providing the actual capabilities to support and implement it.

The Cold War

In May 1951 the Defence Committee prepared a paper titled ‘Strategic Concept for Defence of the ANZAM Region’ detailing the concept for Australia’s defence, founded on forward defence and giving priority to air power. In addition to this role the RAAF was also given the primary role of air defence within the local defence strategy, especially considering the possibility of attacks by Soviet long-range bomber aircraft. These were the two clearly defined national requirements which formed the basis for the development of the necessary force structure and strategy for the Air Force.

The solution to this double challenge was found in the development of a ‘balanced’ force, which included a medium bomber force. The RAAF’s strategic planning was put to test in three major conflicts between 1950 and 1975—Korea, Vietnam and Malaya.

\textsuperscript{11} ibid, p. 100.
There are different views regarding the strategic lessons from these engagements. The lack of involvement of RAAF officers at the higher planning level and its disadvantages had been clearly demonstrated during World War II. Therefore, it is more than perplexing that the RAAF once again failed to make the most of the opportunity provided by its involvement in the Korean War. Although the strength of the RAAF contribution was not merely token representation, no officer above the rank of wing commander served in the United Nations headquarters staff.

The RAAF involvement in operations against communist terrorists during the Malayan Emergency and its effectiveness has often been debated. However, air power again demonstrated its basic strengths—flexibility, pervasiveness and rapid strike capability at minimal human cost to one’s own forces. In Vietnam the RAAF was a minor contributor, although its units performed with distinction at the operational level. Other than for the transfer of control of battlefield helicopters to the Army, the RAAF was content with learning the larger lessons that were inflicted on US air power during this war.

The Current RAAF Strategy

After World War II the RAAF has remained a comparatively small air force supported by a limited population and financial base and with a vast area to cover. Exploiting technology to cope with the challenges that these circumstances pose is a logical approach. However, developing a strategy that aligns and dovetails with the national requirements and perceptions of security has not always been an easy task. I believe that it will not be incorrect for me to say that the RAAF has not uniformly been successful in achieving this all-important task from which force structure, capabilities and concepts of operations are developed. However, there are two elements that have provided the continuity factor in the RAAF’s air strategy.

First, technology. For most of the past four decades the RAAF has relied on a technology edge to be the dominant air force in its area of interest. While there were attempts in the 1960s to develop and maintain an indigenous capacity to design and manufacture state-of-the-art fighter aircraft, pragmatism, as ever, led to a rationalisation of the aerospace industry. Even licence manufacture of foreign-designed aircraft was found to be economically unviable. In July 1971 the quest for technological self-sufficiency in military aviation was laid to rest. Leading edge technology thereafter would be obtained from the nation’s primary ally, the United States. However, for another decade or so, the technology edge remained a foundation of the RAAF strategy.

Second, deterrence. Another foundation of the air strategy has been the evolution of a deterrent capability. In fact, ever since the Vietnam War, the RAAF has primarily been focused on developing and fielding visibly demonstrated capabilities in the pursuance

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12 ibid, p. 143.
of a strategy of deterrence. As early as 1956, the RAAF actively made persistent attempts to secure nuclear weapons although it was not unequivocally supported by the political leadership. In the event, nuclear deterrence was not made available to the RAAF. However, the strategy of deterrence through conventional means became a natural expression of the RAAF’s posture.

There are some issues with adopting a deterrent strategy. Its effectiveness is almost completely dependent on the acceptance by the possible opponent of the ability of the force to deliver on its threat. Unfortunately the RAAF did not have the weapon capability until the late 1980s to conduct effective strikes in the pursuit of this strategy, if required. That the bluff was never called is a stroke of phenomenal luck rather than any dedicated planning or strategy. However, the introduction of the F-111 and its subsequent arming with precision guided munitions that gave it surgical strike capabilities provided the necessary teeth to this strategy.

The RAAF strategy of deterrence has evolved through the years from one based on a proven technology edge and then a capability edge and, finally, to one reliant on an alliance edge as more regional powers have closed the capability gap.

A Long-term Strategy

By the mid-1970s the Australian Government had developed the nucleus of an independent national security strategy for the defence of the nation—one that was not based totally on the assistance of great and powerful friends. This necessitated Australia becoming more self-reliant, while continuing to maintain cooperative alliances. However, even as late as 1981, defence planning for the implementation of this strategy was riddled with inadequacies, which in turn had a salutary effect on the force structure and capability development of the RAAF. In these circumstances of intellectual uncertainty the RAAF continued to strive to maintain a balanced force—sort of hedging their bet. However, the concept of defending the air-sea gap as the fundamental premise for force development was inadequate to create a truly balanced force. The dichotomy between articulated strategy and the capability to implement it continued.

There are however five factors that have remained enduring determinants of Australia’s strategic perspective and therefore the most influential elements in the development of air power capabilities—geography, population, infrastructure, economy and alliances. Geography makes it imperative not only to have an effective air force, but to ensure that it has the capabilities required to carry out expeditionary operations. The limited population base from which to draw its personnel constrains the RAAF to remain a relatively small force, thereby compelling it to operate at the leading edge of technology. The infrastructure required to maintain technologically sophisticated capabilities is both expensive and challenging to maintain. The fact that Australia does not have a sufficiently broad aerospace industrial base to sustain a robust and technically sophisticated air force could, if not carefully ameliorated, become the Achilles heel for the RAAF in the long term. The impact of national economy
on air power development and sustainment is not unique to Australia, it is a global phenomenon. Air power is expensive and resource intensive. The outlay required to maintain extant capabilities is considerable and requires a great deal of political will to ensure its adequacy. Obviously, in a democracy this is a political decision and out of the direct control of the air force.

The alliance-dependent nature of security and foreign policies is not unique to Australia. However, Australia’s security policy and deterrent strategy have always been underpinned by a strong and binding alliance with a greater global power—the UK in the early years and the US post–World War II. This has necessitated structuring the military for expeditionary operations for which air power is a critical element.

In accepting these five perennial constraints the RAAF developed the strategy of preventing an adversary from reaching Australian shores, essentially defeating the adversary either in the staging areas or during transit in the air-sea gap. Further, the force structure was clearly optimised for expeditionary operations. In the late 1970s the RAAF articulated a strategy of deterrence based on offensive strike capabilities. It argued that “defensive action may prevent defeat, but wars can be won only by offensive action.” This was endorsed by the then Chief of the Air Staff (CAS), Air Marshal McNamara, making it the first formally approved strategy of the RAAF for the defence of Australia.

There have been a number of reviews and White Papers that have been issued in subsequent years. However, the RAAF has always been and will continue to be a critical element of national power in ensuring the security of the nation. Further, the RAAF roles of denial and control of the air-sea approaches to Australia through deterrence and offensive strike have not fundamentally altered within the broad national security strategy. They therefore remain the underpinning and indelible elements upon which the primary strategy of the RAAF is developed. Even if this strategy is not articulated, it remains the premise on which the RAAF benchmarks all its air power capabilities and develops its concepts of operations. Deterrence and proactive offensive action—the classic roles of air power—clearly embedded in the RAAF strategy.

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The Australian Flying Corps’ Legacy to the RAAF

Mr Michael Molkentin

At the inauguration of the Australian Air Force in March 1921, the vast majority of its founding officers and other ranks brought considerable experience to the job. Practically all of the Service’s 21 founding officers had flown with either the Australian Flying Corps (AFC) or one of the British flying services during the Great War.¹ A review of the RAAF’s ranks one year later reported that 80 per cent of all RAAF personnel had served in the Australian Imperial Force (AIF).²

Although this proportion would drop during the two decades leading up to World War II, especially among junior officers and flying ranks, officers with wartime experience would continue to dominate the Air Force’s leadership throughout the inter-war period. Names synonymous with the RAAF’s early history—Williams, Goble, Anderson, Bostock, Cole, Cobby, Jones and Wrigley, among others—all started their flying careers in biplanes of timber and fabric during the pioneering days of aerial warfare between 1914 and 1918.

Ostensibly, Australia’s Great War airmen represented a pool of sufficient size, talent and experience well and truly up to the task of establishing the world’s second independent air service. Roughly 1000 Australians had fought in a cockpit during the

² Thirty-nine out of 49 officers and 201 out of 252 other ranks had served in the AIF. National Archives of Australia (NAA): Air Services Branch, A1195, Correspondence files, 1 Jan 1921 – 31 Dec 1922, 715/2/224, RAAF Statistics for Gen. G.R. Campbell, 1922–1922, Air Force minute, 24 May 1922.
war,3 57 of them claiming five or more enemy aircraft.4 The AFC’s airmen alone had earned 40 Distinguished Flying Crosses (DFCs) and of just four airmen in the Empire to receive the DFC three times before World War II, two—Arthur ‘Harry’ Cobby and Ross Smith—were Australians. Australian airmen and mechanics had experienced the length and breadth of the Great War in the air. They had carried rifles and vest-pocket cameras aloft over the Western Front and Mesopotamia in 1914–15; flown air defence sorties against Zeppelins over south-east England in 1915–1916; patrolled the Channel for enemy U-boats, cooperated with cavalry in the Sinai Desert, bombed German cities and struggled for air superiority in the skies above the Western Front, Italy and Palestine during 1918.

In hindsight, what the RAAF needed during its first years of existence—years in which it needed to establish itself as an independent Service in the face of considerable Army and Navy resistance—was leaders with political acumen and the experience to secure credibility among their more senior colleagues in the other branches; a broad base of expertise spanning combat operations, logistics, engineering, medicine, administration and so on; and leaders at various levels capable of instilling the new Service with traditions and the necessary discipline to ensure a good public image and safe, efficient operations.

This paper conceives Australia’s contribution to the Great War in the air as a ‘pre-history’ of the RAAF. It argues that although Australian personnel distinguished themselves in combat, the nature of Australia’s involvement in the air war and, indeed, the embryonic state of aerial warfare itself, meant that the Air Force’s founding fathers approached their job with, on one hand, limited experience in command and administration and, on the other, only nascent ideas about air power that did not fully justify the notion of an independent air force. The purpose here is not to provide a

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3 A total of 880 officers and 2840 other ranks served in the AFC during the war. Of these, 563 officers flew (410 as pilots and 153 as observers): Australian War Memorial (AWM) 3DRL 8042/64, Director of Personnel and Training, RAAF, Henry Wrigley to Official Historian, Charles Bean, 21 March 1924 and 28 April 1924. Determining the number of Australians who served in the British flying services is more difficult, as neither the War Office nor Admiralty appear to have maintained separate records of dominion personnel. The Australian War Memorial's Commemorative Roll, however, records 104 Australians killed serving in the RFC, RNAS and RAF. Further, records regarding the repatriation of Australians who served in Imperial units note another 118 who served in the RFC and 226 in the RAF (with those who served with the RNAS before the April 1918 amalgamation being included in the latter total): NAA: Australian Imperial Force, Base Records Office, MT1487/1, Service records and correspondence concerning Australians serving with other Imperial forces, World War 1, 01 Jan 1914 – 31 Dec 1918. It is therefore possible to identify approximately 450 Australians who served in the British flying services during the war, though the total is undoubtedly a little higher on account of the incomplete nature of the Commemorative Roll and the fact that some Australian officers declined to return home after the war.

The Australian Flying Corps’ Legacy to the RAAF

The Origin of Military Aeronautics in Australia

Military aviation developed in Australia between 1909 and 1914, coincident with a significant evolution in national defence and foreign policy. Australian defence authorities felt a growing anxiety during this period resulting from a realisation that Australian and British strategic priorities were increasingly divergent. With the rise of Japan as a regional power and the shift of British naval forces to European waters to counter German maritime aspirations, Australian Governments in the immediate prewar era embarked on an unprecedented expansion of Australia’s defence assets. In the five years preceding the Great War, estimates on defence spending increased by 352 per cent, the number of men in uniform doubled, their training and equipment improved in quality and quantity, and the nation began to develop an autonomous local defence capability.6

Lobbied by aerial defence advocates, in 1909 the Deakin Government sponsored a competition for the design and manufacture, within Australia, of ‘a flying machine for military purposes.’7 The competition failed, none of the entries meeting the Government’s criteria and, more broadly, demonstrating that the expertise and industry to support such a venture did not exist locally. In the meantime, however, tours of Australia by aviators from overseas convinced the Labor Defence Minister, Senator George Pearce, that Australia should have its own flying corps and that it

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would need to import equipment and know-how from overseas.\footnote{See correspondence in NAA: Department of Defence, A289, Correspondence files, 01 Jan 1894 – 30 Apr 1917, 1849/8/31, Trial of Bristol Biplane offered by British and Colonial Aeroplane Co., 1911–1911; ‘An Aviation Corps’, in \textit{The Examiner} (Launceston), 4 March 1911; and ‘Aerial Defence – Australia Makes a Move’, in \textit{The Examiner} (Launceston), 8 March 1911.} These notions were galvanised by Pearce’s visit to Britain in mid-1911 to attend the Imperial Conference where he witnessed flying displays and, of broader significance to Australian defence, learned of the imminence of a war between Britain and Germany which might leave Australia vulnerable in the Pacific.

Pearce returned to Australia and set the General Staff to work on planning for the establishment of a military flying corps. The first decision to be made was whether to establish a school locally from the outset or to send airmen to Britain for training. Although British authorities actively encouraged the development of naval and military forces in the dominions, perceiving their benefit for Imperial defence, they did not press for the development of military aviation. Indeed, the New Zealand, South African and Canadian governments all considered establishing flying schools but decided instead to send officers to Britain for training.\footnote{Squadron Leader J.M.S. Ross, \textit{Official History of New Zealand in the Second World War 1939–45 – Royal New Zealand Air Force}, War History Branch, Department of Internal Affairs, Wellington, 1955, p. 1; Dick Silberbauer, ‘The Origins of South African Military Aviation: 1907–1919 from South African Archives’, in \textit{Cross & Cockade Journal Great Britain}, vol. 7, no. 4, 1976, pp. 174–175; and NAA: Department of Defence, A2023, Correspondence files, 01 Jan 1907 – 31 Dec 1917, A38/7/9, Sth Africa – Military Training, 1914–1914, Lieutenant-Colonel J.G. Legge to Secretary, Department of Defence, 15 May 1914 (although other records show that Legge was promoted to Colonel on 1 May 1914, the document on the National Archives file is clearly signed by Legge as ‘Lieutenant-Colonel’, not ‘Colonel; and as a member of the Imperial General Staff in London).} Australia, alone among the self-governing dominions opted to establish its own military flying school from the outset and, at the end of 1911, advertised in Australia and Britain for two instructors and tenders for four aeroplanes.\footnote{\textit{Flight}, no. 180 (no. 3, vol. IV), 20 January 1912, pp. 57 and 61.}

Though far-sighted, the Australian Government’s support of aviation remained modest as far as finances were concerned. In 1911, though larger than ever before, the Defence Budget was funding the building of a blue water fleet unit and the establishment of a compulsory service scheme, in addition to remedying deficiencies in Army and Navy infrastructure following years of fiscal neglect.\footnote{NAA: Department of Defence, A5954, ‘The Shedden Collection’, 01 Jan 1901 – 08 Jul 1971, 1082/9, Memorandum on Australian Military Defence and Its Progress Since Federation, 1909–1909, December 1909.} By the start of the Great War, the Commonwealth would invest just over £18 000 in aviation (not including estimates...}
under works and appropriations for land): that is 0.14 per cent of total Defence estimates for the 1911–1914 period.\(^\text{12}\)

This meant that an initial proposal by the Chief of the General Staff (CGS) to establish a military flying school and a 12-aeroplane squadron had to give way to a far more modest scheme. The final plan, approved by Pearce’s successor, Edward Millen, in early 1914, involved the establishment of a Central Flying School (CFS) at Point Cook, with a bare minimum of staff and the gradual formation, over three years, of ‘an Australian Flying Corps’ comprising ‘an aeroplane squadron of two flights’, each consisting of four officers and 39 other ranks. Apart from a sergeant and eight mechanics, the squadron would consist of part-time airmen, seconded from their regular militia units. For 1914–1915, the available funding would allow the Department to train four officers and eight mechanics from the citizen forces and four permanent forces mechanics.\(^\text{13}\)

There is not much evidence hinting at how Australia’s defence authorities planned to employ the new aerial arm. Nonetheless, it appears that there was an assumption among those planning the AFC’s establishment that it would exist for local defence. As well as being part of the citizen forces (which could not serve overseas), when tabling his first proposal for a school and flying corps, the CGS suggested the likelihood that seaplanes would be the most useful type, and predicted ‘the probability of the ultimate conversion of the Corps to one whose duties are chiefly confined to coastal employment’. He suggested the school be a joint military and naval establishment, a notion to which the Naval Secretary agreed.\(^\text{14}\) The selection of Point Cook as a site for CFS involved collaboration with naval authorities and prewar naval defence strategy envisaged establishing seaplane bases in northern Australia to provide early warning of an enemy invasion fleet.\(^\text{15}\)


\(^{13}\) NAA: Department of Defence, A2023, Correspondence files, 01 Jan 1907 – 31 Dec 1917, A38/6/70, Establishment Central Flying School, 1914–1919, Military Order Nos 381 and 382 of 1914.

\(^{14}\) NAA: Military Board, A2653, Volumes of Military Board Proceedings, 01 Jan 1905 – 29 Feb 1976, 1913, Military Board Proceedings, ‘Proposals regarding the formation of a flying school and corps’, Military Board minutes, 4 and 5 April 1913; and NAA: Department of Defence, A289, Correspondence Files, 01 Jan 1894 – 30 Apr 1917, 1849/8/243, Request by Naval Board for copy of proposals for the establishment of a Military Aviation School and Corps, Thomas Trumble minute to the Secretary to the Naval Board, 15 October 1912.

The Evolution of the Australian Flying Corps During the Great War

The outbreak of war in August 1914 did not initially alter the Government’s plans regarding military aviation. Its offer of a division to the British Government contained no air component and, indeed, the CGS, Colonel J.G. Legge, put a freeze on increases to aviation estimates, reasoning that as aircraft had ‘little scope’ for contributing to Australia’s defence, funds were better directed elsewhere.\(^\text{16}\)

Within three months, however, attitudes towards military aviation had changed. The press reported on the useful contribution aircraft made during the war’s initial campaigns, and implied their future significance.\(^\text{17}\) In September, the new Federal Labor Government revived political support for aviation by appointing George Pearce for a second tenure as Minister for Defence. In November, he committed an unprecedented £14 430 to the Central Flying School, claiming that aviation’s value ‘from a military point of view’ had been ‘fully demonstrated in the present war’.\(^\text{18}\) The additional funding would allow Point Cook to train a larger number of pilots than anticipated in prewar plans.

The first Australian airmen went on active service in November 1914, immediately after the conclusion of the first CFS course, in which four pilots graduated. One of them and an instructor led an aviation detachment to New Guinea with the 3rd Battalion of the Australian Naval and Military Expeditionary Force. This unit was dispatched to neutralise a German garrison believed to occupy an outpost on the Sepik River. The intelligence turned out faulty however; there was no German garrison and the aircraft and their crews returned to Australia without seeing any action.

Just a few weeks after the aviation detachment’s return to Australia, the Government received an invitation from the Indian Viceroy to provide a flying unit for service in lower Mesopotamia. The Indian Army had established a flying corps itself just before the war, but on the outbreak of hostilities its airmen were training in England and were mobilised with the Royal Flying Corps (RFC). Abandoning its plans for a citizen forces aviation unit, the Australian Government offered personnel and transport to form a half-flight on the condition that Indian authorities provided aircraft and made logistical arrangements to sustain the unit in the field.\(^\text{19}\) Joined by airmen and mechanics from


\(^{17}\) See, for example, ‘The Great War in Europe’, in Kalgoorlie Western Argus, 15 September 1914; and ‘Uhlans Trapped’ and ‘Air Raid on England’, in The Sydney Morning Herald, 23 October 1914.


\(^{19}\) NAA: Governor-General, A11803, Governor-General’s correspondence relating to the war of 1914–1918 [War Files], 01 Jan 1914 – 31 Dec 1919, 1914/89/54, Aviation, 1915–1916, Sir Ronald Munro Ferguson, Governor-General of Australia, cablegram to Sir Charles Hardinge, Viceroy of India, 26 February 1915; and Hardinge cablegram to Ferguson, 7 March 1915.
the RFC, Royal Naval Air Service (RNAS) and Indian Army, this detachment would serve with Indian Expeditionary Force D during its ill-fated campaign to capture Baghdad and efforts afterwards to relieve the 6th Indian Division, besieged at Kut-al-Amara. Although often referred to as the 'AFC Half Flight', the Australians were actually absorbed into an RFC squadron and Australian authorities had practically nothing to do with its supply, administration or operational employment.

While the AFC’s first contingent advanced along the Tigris River, Imperial authorities were considering the contribution the dominions might make to the air war. Lieutenant-Colonel Cecil Marindin, a staff officer in the War Office’s Military Aeronautics Directorate observed that ‘as none of the Dominion forces have their own aviation units, there seems to be an opportunity of making use in the RFC of aviators and mechanics from the different Dominions, and at the same time of fostering a spirit of Imperial Cooperation.’ Rejected by the AFC, during the war’s first 18 months a number of men—including future acting Chief of the Air Staff (CAS) Stanley ‘Jimmy’ Goble—paid their own passages to Britain and joined the RFC or RNAS. What Marindin had in mind, however, was something altogether more formal; he envisaged the raising of four ‘Imperial Colonial’ squadrons. They would be part of the RFC, would train in Britain and be completely financed by the British Government.20

By the time the proposal reached Melbourne in early November 1915, CFS had produced another 15 pilots. Considering the ‘inestimable’ benefit ‘for the future training of the Australian forces’, the CGS Colonel Godfrey Irving recommended offering two flights. He deemed a larger commitment possible, given the pool of trained personnel at the School, but impractical owing to the shortage of senior officers.21 This offer, however, did not fit the RFC’s force structure which, while quite elastic to allow expansion, was based strictly on the foundation of the four-flight (A, B, C and HQ) squadron. The War Office insisted on a larger contribution—minimum of a squadron—and relaxed its condition on dominion personnel being interchangeable with British ones by suggesting that a complete squadron would, ‘probably [be] kept wholly Australian’.22

This convinced the Defence Department to scrape together enough officers—including a few who could not yet fly—and tradesmen volunteers from AIF camps to form No 1


21 NAA: Department of Defence, A2023, Correspondence files, 01 Jan 1907 – 31 Dec 1917, A38/8/542, No 1 Squadron AFC – Formation and Organization, 1915–1916, Colonel G.G.H. Irving, Chief of the General Staff, to Secretary of Defence, 18 November 1915. Irving also considered forming a joint squadron with another dominion ‘impracticable’ for reasons he did not explain.

22 AWM27 303/17 Part 1, Andrew Bonar Law, Secretary of State for the Colonies to Ferguson, 14 December 1915.
Squadron AFC. On British advice, it embarked for Egypt in March 1916 to complete training and commence operations, possibly, British authorities suggested, in support of Australian units. When it did begin flying sorties over the Sinai in June however there was little to distinguish it from the British squadrons with which it cooperated. It was commanded by an Australian-born officer of the RFC, used British aircraft and equipment, worked under the operational command of an RFC wing and until 1918, due to a shortage of AFC pilots, contained a large proportion of officers seconded from the RFC. Although Australian authorities referred to the squadron as No 1 Squadron or 1st Squadron AFC, to the War Office it became No 67 (Australian) Squadron RFC.

Australian authorities initially had no plans to expand the AFC, planning instead to maintain No 1 Squadron with reinforcements trained at Point Cook. In May 1916, however, Lieutenant-Colonel Edgar Reynolds, recently appointed Air Liaison Officer at Australia House wrote to the CGS, urging him to expand CFS considerably, and establish another two Australian squadrons, thus, creating a ‘regular flying corps’. He cited developments in France as evidence that air power would play an important role in future wars and argued that Australia would need strong air defence to defeat an ‘invading army’. It would be far easier, he also pointed out, to obtain funds to develop Australian aviation during the war than after it.²³

Reynolds’ logic found traction with Australia’s political and military authorities who, though consumed with maintaining the AIF, also kept an eye on Australia’s future defence arrangements. When sufficient pilots had graduated from Point Cook in July 1916, the Australian Government offered to raise an additional squadron. The War Office, having recently adopted a scheme to more than double the size of the RFC by spring 1917, eagerly accepted it; and promptly called a conference of dominion representatives in London to discuss their governments’ future contributions to the RFC. This conference proved seminal to Australia’s involvement in the first air war, by establishing principles that would dictate the AFC’s relationship to the British flying services for the rest of the war. Reynolds attended and agreed to British conditions that Australian squadrons receive RFC titles, relinquish the right to appoint squadron and wing commanders, and draw their reinforcements from training units in Britain.²⁴

By the end of 1916, the Australian Government had raised another three service squadrons from partially trained personnel at Point Cook and volunteers in the AIF. These units, along with the nucleus of two training squadrons, embarked for Britain in late 1916 and early 1917, where they would train before deploying to the Western

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²⁴ National Defence Headquarters, Directorate of History and Heritage, Canada, 75/514, file B1, ‘Minutes of conversation held with representatives of Canada, Australia and South Africa, on 26.8.16’; and Army Council to Sir Sam Hughes, Canadian Minister for Militia, 8 September 1916, quoted in Directorate of History and Heritage, 75/514, file D1, pp. 6–7.
The two AFC training squadrons—increased to four later in the year—remained in Britain where in early 1918 they formed an AFC Training Wing. Although up until September 1916 the AIF had allowed its other ranks to accept commissions in the RFC, this ceased following the expansion of the AFC. During 1917–18 British authorities would make several requests for Australian volunteers but the AIF and Australian Government made it clear that this was not possible given a lack of reinforcements for the AIF, and a more quietly expressed concern of ‘the risk of the eyes being picked out of the Australian Squadrons for the R.F.C.’

The Canadian attitude, by contrast, could not have been different. Despite some concern among the Canadian Expeditionary Force’s (CEF) leadership about losing its best men to the RFC during 1917, throughout the war Canadian personnel could transfer to the British services with few official impediments; at least 5022 did so.

For the 1916–18 period, the RFC had three levels of operational command in the field. RFC Headquarters devised policy, co-ordinated theatre-wide logistics and corresponded with the War Office on training and equipment requirements. On the Western Front there were five RFC brigades, one for each of the British Expeditionary Force's armies. RFC brigadiers coordinated the air war over their army front by liaising with army staff to select operational objectives and allocate these to the various wings under their command. The brigade level, as a result, provided a crucial juncture for surface-air cooperation, which the RFC’s General Officer Commanding (GOC), Major-General Hugh Trenchard, regarded at this stage as the fundamental function of air power; the very reason, indeed, for the RFC’s existence. Wings administered personnel and supply for several squadrons and, in assigning objectives set by brigade to individual squadrons, coordinated the day-to-day tactical air war over their sector of the line. In this way the RFC wing had a similar command and control function to the infantry brigade; that is, the higher-level tactical handling of units to achieve objectives set by a senior formation. At the end of the command chain, squadron headquarters allocated the sorties ordered by wings to particular flights and pilots and oversaw the unit’s internal economy.

In this force structure, the role played by the AFC was restricted to the tactical level, that is, squadron and flight command. The only exception to this was Richard Williams, graduate of the first CFS course and the RAAF’s founding CAS. After commanding No 1 Squadron in Palestine during 1917 and 1918, he took command of the squadron’s senior formation, 40th Wing RAF, in July 1918 and, following the

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Armistice, temporarily commanded the Palestine Brigade, RAF. More command appointments like this may have been open to Australians if the AFC had continued to expand. Indeed, during 1918, AFC administrative officers pushed for the establishment of an AFC aircraft park, an Australian strategic bombing squadron, an AFC experimental section and, in the final months of the war, for the transfer of No 1 Squadron from the Middle East to France to form an AFC Army Wing. In each case, the scheme’s advocates rightly pointed out the value such a step would have for cultivating experience relevant to a postwar air force. Overzealous expansion of the AIF during 1915 and 1916 and the failure of volunteer recruitment had, however, made such expansions of the AFC in 1918 impossible. What is more, British authorities refused to transfer No 1 Squadron and would most likely have resisted any expansion of the AFC that did not complement the RAF’s existing force structure.

The AFC’s training establishment was similarly subordinate to a larger British training organisation. Based in Gloucestershire, with a large and well-established reinforcements depot at Halefield, the establishment of the AFC Training Wing in February 1918 gives the AFC the appearance of self-sufficiency and autonomy, whereas it actually operated firmly within, and at the bottom end, of the RAF’s training hierarchy. The AFC Training Wing operated under the command of No 7 Group, one of 23 training groups in the United Kingdom, which, in turn, was subordinate to one of five training area commands. Overseeing the entire organisation, the Air Ministry’s Directorate of Training formulated policy that, during 1918, sought to standardise British aviation training. As a result, the training wing’s Commanding Officer, Lieutenant-Colonel Walter Oswald ‘Toby’ Watt, and his AFC training squadron commanders, only developed experience in administering a training policy, not in the highly complex matter of devising one or developing training across an entire Service. Further, the AFC Training Wing was only equipped to meet a modicum of the Australian service squadrons’ requirements. It could provide general flight training, but pilots needed to attend British schools for theory and specialist courses, while observers and mechanics did all their training in RAF establishments.

Ultimately, the AIF’s insistence that it train its own pilots and its refusal to allow AFC personnel to be interchangeable with their RFC counterparts proved inefficient. In

27 AWM10 4343/14/18, Captain Lawrence Wackett to Reynolds, Staff Officer for Aviation, 22 January 1918; AWM15 2305/11, Captain Clive Baillieu, Deputy Assistant Adjutant General to Colonel Thomas Dodds, Deputy Adjutant General, AIF HQ, 12 October 1917; AWM15 2305/11, Baillieu to Lieutenant Colonel Horace Brinsmead, Staff Officer for Aviation, 1 August 1918; and AWM10 4343/17/12, Baillieu to Dodds, 21 August 1918.

28 As an example of the extent to which the RAF training commands imposed standard procedures on the Australian squadrons, in April 1918, the Officer Commanding (OC) No 7 Group ordered 1st Wing to provide all pupils with two hours of ground instruction in map reading each week. AWM25 943/25, OC No 7 Group RAF to Lieutenant-Colonel Oswald Watt, OC 1st Wing AFC, 30 April 1918.
1918 the AFC had a glut of observers and mechanics,29 whereas the Australian training squadrons struggled to produce enough pilots to replace losses at the front.30 This forced the AFC to borrow British officers to make up the shortfall, and indeed, at one point during the summer of 1918, almost half of No 4 Squadron's pilots were from the RAF.31

This whole anomalous arrangement of having AIF-administered units scattered throughout a British operational command system hinged on a few key staff appointments made in 1917. In May, on the War Office’s suggestion, Reynolds (previously air liaison at Australian House) became ‘Staff Officer for Aviation’ at the AIF’s administrative headquarters in London. He oversaw a small staff which subsequently became known as ‘Aviation Section’ and by the end of the war consisted of two officers, four other ranks and five civilians. From October 1917 it also had an equipment branch, which by the Armistice had a staff of seven.32 Aviation Section also had a liaison officer at RFC Headquarters in France, who provided the London staff with weekly returns regarding personnel in the Australian squadrons. Though ostensibly dealing only with personnel movements, this small organisation actually also involved itself in several matters of equipment, training and policy. In one instance, for example, Reynolds successfully lobbied for No 1 Squadron’s mixed and obsolete establishment of aircraft to be replaced by Bristol Fighters; in another, he succeeded in having the Australian training squadrons based together and provided with permanent accommodation.33 It is a shame, therefore, that more of the AFC’s small administrative staff would not go into the RAAF. Aside from Williams who briefly held the post of Staff Officer for Aviation during postwar demobilisation, the only member to continue in aviation after the war was Horace Brinsmead, who succeeded Reynolds in mid-1918. His association with the RAAF, in any case, was only nominal, as the Controller of Civil Aviation between 1920 and 1933.

At home, aviation arrangements remained largely stagnant throughout the war because the War Office refused to send modern aircraft and experienced instructors

29 AWM4, Australian Imperial Force Unit War Diaries, 1914–18 War, No 5 Training Squadron AFC, War Diary, June 1918.
30 The AFC Training Wing graduated 55 pilots less than the War Office deemed necessary during the period 21 February 1918 to 11 November 1918: AWM10 4343/32/6, O3 Statistics, the Military Aeronautics Directorate to Drew, 28 August 1917; and AWM224 MSS521, ‘Records 1st Wing Australian Flying Corps 21/2–18−3/3/19’.
31 Determined from data regarding flying officer appointments in AWM224 MSS520, ‘No. 4 Squadron Australian Flying Corps: Records & Statistics’.
32 AWM10 4343/36/21, Manuscript history of AFC HQ, Administrative HQ, AIF by Richard Williams, June 1919.
33 AWM10 4343/14/2, Reynolds to Major-General David Henderson, Director General of Military Aeronautics, 25 September 1917; and AWM10 4343/3/2, Reynolds, Report on visit to Egypt in October and November 1917.
to Australia. As a result, CFS at Point Cook and an aviation school established by the NSW Government at Richmond in August 1916 struggled to provide training relevant to the rapid evolution that aerial combat underwent during the war. When the AFC’s first pilots arrived in Britain with the new squadrons in early 1917, they were so poorly trained that the War Office started them on British courses from scratch and advised the Australian Government to abandon training at home altogether. The AIF’s leadership agreed, and from mid-1917 drew practically all the AFC’s reinforcements from volunteers in AIF units overseas.

Anxious not to retard the development of Australia’s future aerial defence, the Commonwealth nonetheless insisted on keeping CFS open throughout the war, though the handful of cadets that it sent overseas during 1917 and 1918 had to complete the entire British course alongside their comrades who volunteered from the trenches. Graduates from the NSW school faced a similarly frustrating situation, though theirs was complicated further by an uneasy relationship between state and commonwealth authorities, stemming from the Defence Department’s belief that a state government had no authority in training military forces. As the Commonwealth Government would only accept NSW graduates into the AFC as air mechanics, two-thirds of its 61 graduates opted to enlist directly in the RFC, where they, like their Point Cook counterparts, completed the entire British course.

In November 1917, the Federal Government approved a scheme to completely reorganise local aviation training along British lines. AFC and Australian officers from the RAF came home in mid-1918, and CFS was expanded to include a School

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34 For evidence of the difficulty Australian authorities had in procuring aircraft during the war see correspondence in NAA: Department of Defence, A1952, Correspondence files, 30 Jul 1917 – 31 Dec 1941, E524/10/408, Supply of Aeroplanes and Engines to Central Flying School – 1914–1920.


of Military Aeronautics, a permanent flight training squadron and a supply depot.\textsuperscript{38} The arrangements would turn out 25 pilots per month; a miniscule contribution when compared with the 1200 coming out of RAF schools each month but significantly larger than anything the AFC had done previously (Point Cook trained about 120 pilots throughout the entire war).\textsuperscript{39} In the event however, the war ended before the first course in the new scheme began. With the disbandment of the AFC in 1919, the new training units went too and the NSW Government closed its aviation school due to a lack of civilian interest. Despite the best efforts of home authorities during the war, therefore, the RAAF was left in 1921 to practically start from scratch in terms of infrastructure and organisation.

A shortage of materiel and expertise had provided the main impediment to the development of aviation in Australia. The War Office believed that under the pressure of war it could provide neither to its distant dominions.\textsuperscript{40} The significant exception to this was Canada, in which the War Office established an immense training system that by the Armistice was turning out 230 pilots—or roughly a dozen squadron’s worth—per month.\textsuperscript{41} Unlike Australia, New Zealand, South Africa and India, Canada was both closer to Europe and, most significantly, had access to North American industry. Indeed, the War Office only agreed to establish training schools to Canada on

\textsuperscript{38} NAA: Department of Defence, MP367/1, General Correspondence Files, 01 Jan 1917 – 31 Dec 1929, 559/28/310, Central Flying School – Re-organisation, 1918–1918, Department of Defence minute, 5 August 1918; and Military Order – ‘Central Flying School’, n.d. (slip of paper attached to this draft Military Order by Legge is dated 6 September 1918).

\textsuperscript{39} Wise, \textit{Canadian Airmen and the First World War}, pp. 117–118. Determining exactly how many pilots trained at Point Cook is problematic because the school’s records are incomplete. Data from the various reports on the school’s first eight courses, however, reveals that 125 cadets started at the school and 104 graduated or were attached to squadrons embarking for overseas, having not completed the course but demonstrated an aptitude for flying. (See NSWSR NRS12061 4/6254.2, Data provided to the NSW Premier, William Holman by Minister for Defence, Senator George Pearce, 27 March 1917; and NAA: Department of Defence, MP367/1, General Correspondence Files, 01 Jan 1917 – 31 Dec 1929, 600/4/15, Central Flying School Report – Financial Year 1916–1917, 1917–1918, Department of Defence minute, 5 August 1918.) There are no surviving reports relating to further courses. Nevertheless, the embarkation of a ‘special draft’ of flying officers from Sydney on 2 February 1918 suggests that a ninth course ran in late 1917 (see AWM8 8/15/3, ‘Australian Imperial Force: Nominal Roll – Australian Flying Corps – November, 1917 to May, 1918, Reinforcements and Special Drafts’). Further evidence comes from an advertisement for a tenth course of approximately 12 weeks duration, to begin 4 February 1918 (\textit{The West Australian}, 5 January 1918). The graduates from this course may have been the 16 flying officers who embarked from Sydney as another ‘special draft’ for the AFC on 3 June 1918. On 22 June 1918, \textit{The Sydney Morning Herald} announced another course at CFS to begin on 19 August. There is no evidence that this course actually ran, and indeed, given the arrival of the Australian ‘aviation party’ from Britain and the Defence Department’s decision to reorganise training in August, it is likely that it never commenced.

\textsuperscript{40} See for example, The National Archives, Kew, AIR1/140/15/40/306, Bertram Cubbitt, Secretary, War Office, to the Under Secretary of State for India, 2 October 1915.

\textsuperscript{41} Wise, \textit{Canadian Airmen and the First World War}, pp. 117–118.
the proviso that they could maintain themselves with locally produced materiel.\textsuperscript{42} In contrast, Australia had no aviation industry in 1914. Attempts to establish one by both the NSW and Commonwealth Governments proved abortive and, indeed, revealed that a lack of local industrial infrastructure and access to raw materials (not to mention expertise) put Australia several years, at earliest from being anything near capable of producing aircraft.\textsuperscript{43}

\textbf{Conclusions}

Although the war disrupted the Australian Government’s initial plans for an air service, ostensibly it ended up furthering them by producing a pool of experienced airmen and mechanics and providing equipment, in the form of the ‘Imperial Gift’ of 200 aircraft that Britain gave Australia after the war. Further, Australia’s contribution to the air effort was far more visible than that of the other dominions, a fact that contributed to Prime Minister Hughes’ efforts to justify greater Australian agency in postwar Imperial politics. In contrast, the contribution of the other dominions’ airmen has gone largely unnoted. The Canadians became an exception to this only in 1980 with the publication of S.F. Wise’s \textit{Canadian Airmen and the First World War}; though even identifying Canadian pilots proved a monumental task as the British services kept no separate record of dominion involvement.\textsuperscript{44}

On the other hand, Australia’s contribution to the air war was smaller than it may have been given different government policy. Relative to population size, Canada contributed more than three times the number of personnel to the air war than Australia and in terms of flying officers alone, at least twice as many South Africans

\textsuperscript{42} The National Archives, Kew, AIR1/683/21/13/2234, precis of files on training, 1910–1918.
\textsuperscript{43} NAA: Department of Defence, A2023, Correspondence files, 01 Jan 1907 – 31 Dec 1917, E168/3/22, Aviation in Australia – Proposal for Aeroplane Factory, 1916–1916, Department of Defence minute, 27 July 1916; Ernest Scott, \textit{The Official History of Australia in the War of 1914–1918 – Volume XI – Australia During the War}, Fourth edition, Angus and Robertson, Sydney, 1938, pp. 276–277; and NAA: Department of Defence, A2180, Correspondence files, 01 Jan 1918 – 31 Dec 19207, 1821/1/6, Construction of Aircraft in Australia, 1918: Aeroplane Construction Committee – Correspondence & General File, Aeroplane Construction Committee meeting minutes, 1 October 1918.
\textsuperscript{44} Wise, \textit{Canadian Airmen and the First World War}, p. xii.
flew during the war as Australians. The explanation lies in the Canadian and South African Governments’ fundamental belief that manpower was the most useful contribution to the air effort; not complete squadrons. There was, hence, no limit to the number of positions for pilots from these dominions. Ironically, by jealously guarding the AFC’s distinct identity and, particularly, refusing to allow AIF officers to serve in British squadrons, the Commonwealth put a ceiling on the extent of Australia’s involvement in the air war.

These arrangements also limited the breadth of experience with which Australian airmen returned home. Of the AFC’s 880 officers, only one commanded a wing, eight commanded squadrons and 57 commanded flights under service conditions. In contrast, among the 450-odd Australians who flew in the British flying services, 48 returned home as captains (flight commanders) and 16 as majors (squadron commanders), in addition to those killed or who decided to stay in Britain. Four Australians in the British services had commanded wings. Ironically then, it appears an Australian had roughly twice as much chance of being promoted above lieutenant in the British services than he did in his native flying corps. In either case, few Australians had the opportunity to gain experience in administration, medicine, logistics or training organisation.

In terms of the development of air power theory, the Great War had not provided a convincing argument in favour of an independent, strategic role for military aviation. The limited strategic bombing campaigns waged by both sides had caused little material damage and certainly nothing approaching the disintegration of society predicted by prewar aviation advocates. On the other hand, aircraft had clearly demonstrated their value in army and naval cooperation. Australian airmen had spent

45 Approximately 4168 Australians served with the AFC and British units. Wise claims ‘substantially more than 20,000’ Canadians served in the same (Wise, Canadian Airmen and the First World War, p. xi. See also pp. 593–94 regarding calculations for this figure). The populations of Australia and Canada in 1916, according to their respective national statistical bureaus, were 4.91 million and 8 million. According to the South African Air Force official history, South Africa provided 3000 flying officers to the RFC (compared with Australia which provided 563 flying officers to the AFC and approximately 450 to the British services). South Africa had a wartime population of approximately 6 million. James Ambrose Brown, A Gathering of Eagles: The Campaigns of the South African Air Force in Italian East Africa June 1940–November 1941 with an Introduction 1912–1939, Purnell, Cape Town, 1970, p. 5; and Tukufu Zuberi, Amson Sibanda, and Eric Udjo (eds), The Demography of South Africa, M.E. Sharpe Inc., New York, 2005.

46 ‘Service conditions’ includes command appointments in an active theatre of war prior to the Armistice. These figures come from squadron nominal rolls provided in manuscript histories prepared by the units for the Australian War Records Section, AWM224 MSS515 (No 1 Squadron), MSS517 (No 2 Squadron), MSS518 (No 3 Squadron) and MSS520 (No 4 Squadron).

47 NAA: Australian Imperial Force, Base Records Office, MT1487/1, Service records and correspondence concerning Australians serving with other Imperial forces, World War 1, 01 Jan 1914 – 31 Dec 1918.

48 Coulthard-Clark, The Third Brother, p. xviii.
their war patrolling with fleet units, directing artillery, gathering intelligence for army staff and bombing tactical targets to support the troops on the ground. They would have difficulty conceiving, let alone convincing their colleagues in the two senior Services, that anything should change in the postwar period.

The effect of all this was somewhat counterproductive to the development of the RAAF. The Great War left Australia with a thousand or so officers, many of whom had extensive flying experience but lacked skills in other areas essential to military leadership and administration. Richard Williams, one of the few AFC officers with a prewar professional army background, recognised this in a report on the AFC in early 1919:

> It has been the practice to take a cadet, train him as a pilot or observer, and when qualified as such to grant him a commission; this has meant that many members have gone from privates to officers without any special training on the military side of their work. There is no time or opportunity to give them this instruction in the Field, and so numbers of young officers have no idea of their responsibilities as such nor of ordinary regimental duties.49

The CGS, Gordon Legge, made the same observation in May 1918, predicting that a future Australian air force would need to rely on leadership from the RAF.50 This was unpalatable to the Australian Government however, and in the event, the RAAF had to negotiate its formative years relying largely on local talent.51 When it came to materiel however, Australia would not have the opportunity to be so fastidious. If nothing else, the difficulties of maintaining a flying corps at home during the war clearly pointed to the reliance that Australia would have on British industry for some time to come.

Although the results of all this are beyond the scope of this paper, one anecdote will suffice to sum up something of the AFC’s legacy for the RAAF. Harry Cobby enlisted in the AFC in 1916 from his job as a bank clerk. He had, by his own admission, little desire to go to war but felt pressured by ‘patriotic but blundering “flagwaggers”’.52 Despite his initial lack of enthusiasm, Cobby returned to Australia in 1919, the AFC’s top-scoring fighter pilot and one of only three airmen in the world at that stage to have received the DFC three times.

Cobby joined the RAAF as one of its founding officers in 1921. His flying skills and extensive experience as a flight commander must have been an asset to the first

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49 AWM224 MSS510 Part 2, Manuscript history of the Australian Flying Corps by Lieutenant-Colonel Richard Williams, c. 1919.
generation of pilots who joined the RAAF fresh from civilian life. While commanding a squadron at Richmond in late 1930, Cobb’s unit was inspected by the CAS at the time, Richard Williams. In 1989, Air Commodore P.G. Heffernan would recall for Chris Clark that:

The CO, Harry Cobb, was supposed to sign our logbooks every month, but things were such a shambles that Cobb was running around with a pen signing logbooks against the walls of the Mess at the last minute, saying ‘Get your logbooks, quickly, quickly!’\textsuperscript{53}

When Williams arrived he paraded the unit and told it that it was ‘the worst’ he had ever seen, and threatened to stop Christmas leave if things were not improved. ‘That,’ said Heffernan, ‘will give you an idea of the horrible standards that applied.’\textsuperscript{54} Cobb nonetheless went on to attain the rank of air commodore and during World War II held a number of commands including Director of Recruiting, Commandant of the RAAF Staff School, and Air Office Commanding, North Eastern Area, No 10 Operational Group and First Tactical Air Force. It was in this latter role that, in genuinely sad, though perhaps not unanticipated circumstances, Cobb’s career ended. An inquiry into the ‘Morotai Mutiny’ deemed that Cobb had ‘failed to maintain proper control over his command.’\textsuperscript{55}

The courage, flying skills and tactical leadership qualities of Cobb and his peers among Australia’s Great War fliers are beyond doubt. Their capacity to build an air force up from scratch in 1921, however, remains very much open to question.

\textsuperscript{53} Coulthard-Clark, \textit{The Third Brother}, p. 363.
\textsuperscript{54} ibid.
An Air Force Fit for Air Displays?
The RAAF 1921–1939

Professor John McCarthy

It was Dr Chris Clark, the Air Force Historian, who suggested the title of this paper: ‘An Air Force Fit for Air Displays’. All I might do is add a question mark, then ask a further question: could the RAAF at any time up to the outbreak of war have been fit for anything much else? Was the Royal Australian Air Force for these 18 years simply a specie of show pony?

L.P. Hartley, in his great novel, The Go-Between, states: ‘The past is a foreign country: they do things differently there’.1 For a moment let us think of ourselves in the 1920s and 1930s. Forget the 21st century concept of the serviceman being an expected combination of warfighter, social worker, counsellor and peacekeeper. Armed services then existed primarily to fight efficiently and promptly. Only actual fighting or the threat of being able to fight justified their being. In peacetime such expectations suggest obvious problems. As Rudyard Kipling voiced one aspect as it affected the ‘common’ soldier:

Then it’s Tommy this, an’ Tommy that, an’ “Tommy, ‘ow’s yer soul?”
But it’s “Thin red line of ‘eroes” when the drums begin to roll.”2

Armed forces then and their ability to fight efficiently and promptly—possibly only two states entered World War II with armed forces able to do that: Nazi Germany and Imperial Japan. France fell to the German Blitzkrieg after six weeks of fighting. The Royal Air Force (RAF) and its Advanced Air Striking Force lost over a thousand aircraft for no military advantage whatsoever during the Battle for France. Dunkirk was a disaster for the British Army and a triumph for the English ability to turn disaster into its opposite. The early operations of RAF Bomber Command were tragic. It was found by November 1941 that just five of every hundred aircraft dispatched got within five miles of the target and this at the cost of over 9000 aircrew.

From June 1941, German land and air power forced the Red Army into continuous defeat and by December 1941 advanced German units could see the spires of Moscow. Only after the successful Battle of El Alamein in October 1942 was Winston Churchill able to say, ‘This is not the end, it is not even the beginning of the end, but it is,

perhaps, the end of the beginning.’\textsuperscript{3} It took nearly a year after the entry of America into the war for the United States Army Air Force in Britain to mount its first and very minor European bomber operation against Rouen and not until January 1943 before it made its initial tentative entry inside German airspace. The Royal Navy was unable to counter the U-boat threat in the vital Battle of the Atlantic until 1943 and only then with the arrival of very long-range aircraft.

From December 1941, the Japanese armed forces began the most successful series of military campaigns in modern history. Inside four months, the Japanese had made themselves rulers of over 100 million people, had acquired access to vast quantities of raw materials, and with control of the air and sea had killed or captured over 250,000 Allied troops, among them the Australian 8th Division at Singapore.

Remembering this, let us return to the Royal Australian Air Force in the inter-war years. If you needed an identifiable enemy, where was it? In the 1920s, hard to find. The 1914–18 war was expected by some to be ‘the war to end all wars.’ In 1919 the British War Cabinet declared its ‘ten year ruling’:

> It should be assumed, for framing revised Estimates, that the British Empire will not be engaged in any great war during the next ten years, and that no Expeditionary Force is required for this purpose.\textsuperscript{4}

In 1925 this ruling was extended to include Japan: ‘... aggressive action ... on the part of Japan within the next ten years is not a contingency seriously to be apprehended.’\textsuperscript{5} It took the Japanese attack on Shanghai seven years later to have the ‘ten year ruling’ lifted entirely.

When it was in place though the armed services were horrified. As one of the best thinkers the Royal Air Force has produced, Sir John Slessor, argued ‘... the ravages of the ten-year rule ... [largely contributed to the fact] that when war came neither Service was properly equipped for the responsibilities it had to carry.’\textsuperscript{6} Australia, almost totally reliant on the United Kingdom for its defence opinion, could be forgiven


\textsuperscript{5} Note by M.P.A Hankey, Secretary to the Committee of Imperial Defence, 2 July 1928, printed in Sir Charles Webster and Noble Frankland, \textit{The Strategic Air Offensive Against Germany 1939–1945 – Volume IV – Annexes and Appendices}, Her Majesty’s Stationery Office, London, 1961, p. 85.

for also neglecting its armed services and particularly the RAAF. As Air Marshal Sir Richard Williams, Chief of the Air Staff on three occasions from 1921 to 1938, remarked bluntly many years later: ‘There was little point in asking for money for a new Service if there was no foreseeable enemy’.7

Thus, an air force fit only for air displays? Another question: given the defence planning structure of the 1920s and 1930s: would asking for money to develop the RAAF have been usefully productive even if there had been a ‘foreseeable enemy’? Another line of explanation thus emerges to fill the RAAF ‘show pony’ image. For some, organisational analysis is tedious. For the inter-war RAAF, however, the workings of the defence structure were important.

The administration of the RAAF lay with an Air Board but for the first five years of its existence the Air Board did not have a direct line of communication with the Minister for Defence or the Secretary of that Department. An Air Council was superimposed between the Air Board and the Minister. Its members included an admiral as Chief of the Naval Staff and a major general as Chief of the General Staff. The two RAAF members were the Chief of the Air Staff, the 31-year-old Wing Commander Richard Williams and his deputy, Wing Commander Stanley Goble. Despite holding the title Chief of the Air Staff, Williams needed Air Council approval for any RAAF expenditure over £100.

The admirals and the generals did not want a separate air force at all. As Williams noted in 1926:

The very fact that the Army and Navy still contend that the Air Force is nothing more or less than an auxiliary to the older services is sufficient proof that they fail to realise the characteristics and possibilities of aircraft applied to war.8

The supreme defence planning body was the Council of Defence. Its membership included three admirals and three generals. Williams, by the late twenties a group captain, was the sole RAAF representative. In March 1932 a sub-body of the Council of Defence, the Defence Committee, reported:

... with the Chief of the Air Staff dissenting, [we] see no reason for maintaining a separate organisation for the Air Force in Australia, as conditions are not comparable to those existing in European countries.9

7 Interview, Sir Richard Williams, Melbourne, 1968.
9 John McCarthy, Australia and Imperial Defence 1918–1939: A Study in Air and Sea Power, University of Queensland Press, St Lucia, 1976, p. 38 and see pp. 27–34 for an examination of the inter-war defence planning structure.
Strange reasoning, surely? Nevertheless, Williams needed all his considerable political skill to save the RAAF from extinction.

There is an axiom: those who control the agenda tend to control the meeting. Given the importance of rank in the armed services, Williams could not do that. Raw money figures make the point. From 1924 to 1929 over £12.5 million was spent on the Navy, £7.5 million on the Army and just £2.5 million on the Air Force. Note the primacy of the Navy. Even as late as 1937 and the first federal election fought around defence and foreign policy issues, a slogan of the United Australia Party (UAP), the forerunner of the Liberal Party, was ‘A vote for the UAP is a vote for the Royal Navy’. Australian frontiers, it seemed, lay just outside the Strait of Dover, and the RAN was designed to come under British strategic control on the outbreak of war. The RAAF had no such doubtful influential connections.

In 1929 the RAAF had an approved establishment of 110 officers and 860 airmen. A part-time Citizen Air Force formed in 1925 mustered 54 officers and 285 other ranks. Just enough for a reasonable air display perhaps. What else could have been done with £2.5 million? Nothing ambitious, surely. A comparison makes a point. In 1931 some £9 million was spent on much-needed social services in New South Wales alone.

In 1928 a British air marshal, Sir John Salmond, came to Australia to inspect and report on the RAAF. There could have been little surprise when he concluded:

> Due to the obsolete types of service machines in use throughout the Air Force, to the entire absence of any reserve equipment, and to the low standard of training in these operational units, I have to report that I consider that the R.A.A.F. would be totally unfit to undertake war operations in co-operation with the Navy or Army ...  

No mention of operations separate from the other Services. That would have been fantasy. As, of course, was the ability to fight promptly and efficiently in any circumstances.

The success of the Nazi Party in Germany and the evidence of Japanese aggression in Asia provided the 1930s ‘foreseeable enemy’. Yet by 1934 the RAAF possessed just 68 operational aircraft and none of them could be considered first-line types by mid to late 1930s standard. If a state relies on overseas supply for military equipment, it may well be at a considerable disadvantage. Australia relied on United Kingdom for supply. The United Kingdom naturally put its own wide interests first. Australian needs were of second or third importance.

By March 1936, orders worth £1 700 000 (or $119 000 000 in today’s values) had been placed for the supply of British aircraft. To get them delivered proved impossible.

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The United Kingdom itself was rearming and British strategic interests dictated that two squadrons of the very type of fast medium bomber ordered by Australia went to Turkey, with the promise of a further 60 aircraft to be delivered by 1939. Finland, Greece and Romania were given priority for the supply of the Hurricane and Spitfire. Reluctantly, Australia, the loyal dominion, turned to the United States for the supply of 50 of the twin-engined Lockheed Hudsons. Belatedly, it began its own aircraft manufacturing program. A result was that the Wirraway was in production by 1939.

Australia also relied on the United Kingdom for the supply of bombsights, bomb racks, and blind flying and gunnery equipment. It was not supplied. When, on 3 September 1939, Robert Menzies performed his ‘melancholy duty’ and followed the United Kingdom steadfastly, and without consulting Cabinet, into war with Germany, the RAAF had still only completed 11 of the 17 squadrons recommended as the minimum requirement by Air Marshal Sir John Salmond 11 years previously. It still did not have on its inventory a single first-line aircraft.

So back to the question: was the RAAF between 1921 and 1939 an air force fit only for air displays? Flying in the 1920s and 1930s had the image of daring glamour, and the dour Richard Williams in fostering flying displays proved salesman enough to market them, if only as a means of keeping the idea of an air force alive.

It may have been unwise. The public display of RAAF aircraft tended to end in disaster. Examples must suffice. A 1924 air show resulted in four damaged aircraft when the pilots made the error of not recognising a change in wind direction. In April 1927 two aircraft collided over Melbourne when the RAAF provided a fly-past to honour the visit of the Duke of York. Two weeks later, a demonstration of 24 aircraft, organised to mark the opening of Parliament House in Canberra, resulted in one aircraft diving into the ground killing the pilot and only just avoiding the royal guests. Richard Kingsland, then known as Julius Cohen and later a very distinguished Air Force officer, narrowly escaped death during his display at the 1938 air pageant at Flemington Racecourse, Melbourne.12

In 1937 an ex-Chief of the Air Staff, RAF, Sir Edward Ellington, inspected the Royal Australian Air Force. His controversial report censured junior and senior Air Force officers for failing to enforce correct flying procedures and strongly criticised the level of aircrew training. It was not a minor rebuke. It saw the end of Richard Williams, perhaps unjustly, as Chief of the Air Staff. The past is indeed a ‘foreign country’. There were no Red Flag exercises then where comparative performance could be observed.

Alan Stephens has pointed to the less than disciplinary rigid flying club atmosphere which pervaded sections of the pre-1939 Air Force. Thus it might be reasonable to conclude that as a ‘show pony’ it was one possibly best not shown. The main thing was

though that the RAAF had survived. In doing so it had flown hundreds of thousands of hours, it had photographed many square miles of previously unvisited and virtually unapproachable country. Landing strips had been surveyed and stretched across the continent. There were aircraft depots at Laverton and Richmond, and eight main RAAF bases stretching from Darwin through to Western Australia, New South Wales, Victoria and Queensland. Its senior officers had urged the establishment of a local aircraft industry and the Service continued to operate the long-established Flying Training School at Point Cook.

From there, Australian trained pilots accepted short service commissions in the Royal Air Force. One such was Donald Bennett perhaps the finest all-round airman ever produced. An air vice-marshal of the Royal Air Force at 33, he formed and led the Pathfinder Force within Bomber Command. The successes of the strategic air offensive against Germany would have been fewer, if possible at all, without his skill and leadership. If one regards the bombing of Germany as an important factor in the defeat of the Third Reich then perhaps this defeat owes something to the continued existence of the RAAF in those troublesome inter-war years.

It has been claimed that by 1945 the Royal Australian Air Force possessed the fourth largest air force in the world. Its members had certainly fought in most conceivable theatres. But that is another story. I shall leave my one here.
The RAAF in Three Wars

Dr Chris Clark

In September 1939, eighteen years after it was formed, the RAAF took part in its very first war. Nothing in its previous history had prepared Australia’s air force for a conflict on the scale of World War II, which lasted six years until August 1945. Just five years after that conflict ended, RAAF personnel became engaged in the Korean War, which lasted from June 1950 until June 1953. Eleven years after that conflict ended, in 1964, the RAAF entered the Vietnam War—a conflict which stood as the longest war in which Australia had taken part, until our current involvement in the Middle East Area of Operations. The RAAF presence in the Vietnam theatre lasted from August 1964 until December 1971.

In effect then, within a period of 32 years in the middle of last century, the RAAF was at war for a total of over 16 years—or half of that period. However, add to that the undeclared war in Malaya from 1950 until 1960, during which RAAF aircraft were attacking communist terrorists in their jungle camps, then we have another seven years that do not overlap with the Korean conflict. It can be said, then, that the period that the RAAF was engaged in active operations stood at a staggering 23 years within the space of 32 years—effectively, two-thirds of the same period.

Such a lengthy record of commitment to operations could not fail but have an effect across Air Force—indeed, across all three of the nation’s armed services. But what did this period hold for the RAAF in particular? What did it do to Air Force, and how did it shape thinking about the nature of the Service we operated and what it was expected to be able to do? Those are the questions I wish to address in this presentation, rather than attempt any sort of narrative account of our involvement in these three and a half wars.

Given all that we heard from the previous speaker about the nature of the air force that Australia maintained in the 1920s and 30s, there can be no mistake in thinking that World War II was the making of the RAAF as a credible and respectable instrument of air power. The most obvious and striking outcome of World War II for the RAAF was its huge expansion in size. From a Service of only 3500 permanent officers and airmen, plus about a tenth that number undertaking part-time duty in the Citizen Air Force, in only a dozen flying squadrons at the outbreak of war, the RAAF grew to a peak strength during the next five years of over 180 000 personnel manning around 100 flying squadrons, flights or special units.

The RAAF had already been in an expansion phase before 1939, as a consequence of the rearmament program on which Australia embarked in anticipation of a major European conflict—just three years before the war began, its strength was two full
squadrons and a personnel strength of less than 1300—but, even so, being able to achieve a fifty-fold increase must rate as a massive achievement.

The RAAF’s equipment, in particular its aircraft, had also undergone a transformation. During the rearmament and mobilisation phases, the RAAF had faced a constant battle to replace the obsolescent aircraft that it operated with more modern and capable types. Because local manufacture was in its infancy when war began, Australia was heavily dependent on overseas suppliers—Britain and the US—to help with expanding and updating its aircraft holdings, and of course both these sources needed the output of their best types to meet their own war needs. But by the war’s last years the tide of this particular struggle had been turned, and by 1945 the RAAF was receiving some of the best combat aircraft available—B-24 Liberator heavy bombers, for example, and P-51D Mustang fighters. As a result, when the war ended, the RAAF had changed from being little more than a training organisation into an air force with formidable striking power.

A similar situation emerged regarding RAAF organisation. Before 1939 the Air Force was not organised for war at all—it consisted purely of a smattering of stations, only just starting to spread around the Australian mainland, all of which were answerable to the Air Board in Melbourne. The Air Board itself was not an operational entity, but purely an administrative body. In March 1940 the RAAF began structuring itself into static area commands based on geographical boundaries. When Japan entered the war at the end of 1941, a more overarching operational system of command was created under ‘RAAF Command’, separate from Air Force Headquarters in Melbourne, and a number of mobile Operational Groups. Eventually the RAAF was fielding the First Tactical Air Force (the RAAF’s largest concentration of air power of the war) during the final Australian operations into Borneo.

Remarkable though all these achievements and changes were, in reality none of them were permanent or created a lasting legacy of benefit to the RAAF. The huge growth in size was simply undone through the demobilisation process after the war ended. By the end of 1948 the number of personnel in the Air Force had dropped to under 7900 and the number of squadrons stood at only 13, so effectively the RAAF was close to being back where it was at the start of the war. The once new and shiny equipment acquired in the last stages of the war was mostly in need of replacement within five years. The RAAF was faced with an experience of block obsolescence akin to what happened when the Imperial Gift of surplus World War I aircraft, that first equipped the RAAF, reached the end of its useful life. When it came to organisation, none of the tactical components of the RAAF’s wartime structure were retained after the war. The system of area commands did remain, however, reputedly giving rise to Air Officers Commanding (AOCs) inclined to view their role as a new breed of ‘war lord’. Because a geographical basis was not unacceptable in peacetime, this system stayed with the RAAF until 1954 before giving way to functional commands. Even so, organisation was not an area that was in much better shape than it had been before.
Perhaps the most important gain from the experience of World War II was something far less tangible than equipment, or apparent than organisation, even though it was an expression or a function of both. I conclude that the real gain of World War II was the realisation in Australia of the global reach of air power. Before 1939, RAAF aircraft had rarely ventured outside mainland Australia and when they did, it was regarded as an exceptional and major event. Examples here would include Group Captain Williams’ flight out to the Solomon Islands in 1926, the air survey for oil in Papua and New Guinea conducted the next year, and the trip to Singapore made by Air Vice-Marshall Williams as Chief of the Air Staff to represent Australia at the opening of the new naval dry dock in 1938.

Over the course of World War II, aircrew in RAAF uniform were seen across the world, serving in land and maritime theatres almost everywhere—England, Western and Southern Europe, across the Mediterranean and its North Africa and eastern littoral, around the Middle East, across the Atlantic and North Sea as far as Scandinavia and North Russia, in India-Burma, South-East Asia, and of course the South-West Pacific extending as far north as the northern Philippines. Once training areas like Canada and Rhodesia (now Zimbabwe) are added in, along with aircraft ferry routes across the Pacific from the US, then the RAAF presence virtually crisscrossed the globe—even the Amazon Valley of South America had seen the passage of RAAF aircraft! (In March 1944, six Sunderland flying boats made their way out from England; said one crew member in his diary: ‘The prospect of a 1700 mile journey to Brazil is not frightening me at all – ten years ago it would have been looked upon as a bit of a feat, but time marches on’.)

While it was true that RAAF authorities were directing operations only in areas close to home, the extent of the RAAF’s personnel commitments justified the opening of an Overseas Headquarters in London, and Liaison Offices in places like the US, Canada, India and Rhodesia. The RAAF even had its first designated station outside the Australian mainland—Sembawang on Singapore Island, before the Japanese attack.

While this spread of activities also shrunk dramatically when the war ended, there was a legacy in people’s minds, in the form of an understanding of the uses and utility of air power. As a side benefit of the wartime RAAF’s huge size, this development now became instilled across a large segment of the Australian population. Bear in mind that roughly a million of our national population of seven million had been in uniform during World War II, so the round figure of 200,000 with Air Force experience formed a quite significant proportion of this. It is not unfair to say that a large segment of the nation had truly become air-minded for the first time (and with a realistic appreciation of air power’s impact, not one fostered by prewar air shows). By comparison, in World War I the number of Australians who served in the Australian Flying Corps (AFC) or British air services had been only a few thousand (certainly less than 5000), so the difference was important.

The experience of World War II had also been important for highlighting another inescapable reality of Australian defence politics, in that the RAAF’s contribution had
been almost wholly in concert with friends and allies. There was no real surprise here, because the prewar expectation had always been that Australia would repeat the AFC example in the event of another major European conflict and form a reinforcement element for the RAF. Although Japan’s entry into the war had shifted the focus onto local air defence in a way never before experienced in this country, it was notable that Australian airmen functioned as supporting partners to both the British first, and then the Americans—it is striking that there has been practically no instance in subsequent decades where the same has not been the case.

Now, the global dimension and the partnership aspect of RAAF activities stayed important throughout the immediate postwar period. In 1946 a fighter wing of three Mustang squadrons became the RAAF’s contribution to the British Commonwealth force sent to take part in the occupation of defeated Japan, serving alongside the Americans. This not only necessitated the institution by the RAAF of a long-range courier service to Japan, to support Australia’s deployed forces, but it also put RAAF transports in a position to undertake two little-known interventions in China’s civil war. The first involved eight special flights by three C-47 Dakotas to airlift loads of pig bristles (needed for the manufacture of paintbrushes) out of Chungking in May 1946; the second entailed the use of a single C-47 to evacuate personnel from Australia’s Embassy in Nanjing in November 1948 ahead of the city’s capture by communist forces.

In this same period the RAAF was also making its presence felt elsewhere. In 1947, for example, a RAAF transport delivered the first team of Australian peacekeepers (including one RAAF officer) to Indonesia, where they assisted in monitoring a UN ceasefire between Dutch forces and local nationalists seeking an independent republic. The same consideration of working in support of, and in conjunction with, our former wartime allies also saw a RAAF contingent committed to the Berlin Airlift in 1948–49—a humanitarian operation which is generally regarded as marking the start of the ‘Cold War’ confrontation between the United States and the former Soviet Union.

So, here was a pattern emerging of the Air Force being continually called on to support the initiatives of the Australian Government in international policy, and it was a direct product of the enlarged role envisioned for the RAAF as a consequence of World War II. Before the war, governments had often called on the RAAF to support national development initiatives, but now the same impulse extended to policy goals well beyond Australia’s borders. Now this was something new!

The same commitment to support alliance initiatives, to bolster security and stability measures (short of war) in regions beyond Australia, lay behind the next operational call upon the RAAF. This came in 1950, when Britain sought Australia’s help in dealing with the Malayan Emergency. The dispatch of, first, C-47 Dakota transports, and shortly afterwards Lincoln bombers, marked the beginning of a role on the Malay Peninsula that lasted until the Emergency was declared over—some 10 years later. The Dakota transports were withdrawn in December 1952, but the Lincolns stayed until 1958 when they also came back to Australia. Although replaced by Canberra
The RAAF in Three Wars

bombers and two squadrons of Sabre jet fighters, which also occasionally took part in counterterrorist strikes, the Malayan Emergency was effectively over for several years before it was officially proclaimed as being at an end in 1960.

I do not believe that there is a lot to be made of the sort of missions that the RAAF was performing in Malaya, since dealing with low-level insurgency was not spectacular or war-winning stuff, and it is doubtful that its consequences changed or shaped the way the RAAF conducted itself. The features that warrant noting about this commitment were its duration, and its place within the special arrangements that Australia entered with Britain and New Zealand to underwrite the defence and security of the Malayan area. Most interesting perhaps was the willingness of Britain to accede to having senior RAAF officers taking turns with the RAF in actually commanding the air operations in this theatre, beginning with Air Vice-Marshal Fred Scherger in 1953.

Even before the Emergency entered its final stages, Australia agreed to join in a Strategic Reserve arrangement to provide a long-term garrison to help ensure the security of the Malay Peninsula. As a consequence, the RAAF became locked into maintaining a large overseas base at Butterworth for the next 30 years, from 1958 until 1988. The base was never used to prosecute a war in itself, but it did play a significant part in supporting a new operational deployment to Ubon in Thailand in 1962—a commitment that, at the time, was seen by Australia and its SEATO allies as forestalling an expected communist invasion across the Mekong. A few years after that came the positioning of Sabres at Labuan to guard against the possibility that Australia, along with Britain and New Zealand, might become embroiled in a regional conflict with Indonesia over the latter’s opposition to the formation of the Federation of Malaysia. The maintenance of the Butterworth base also came into its own when Australia began to become involved in the growing war in Vietnam. While its practical value was obvious, the base held huge psychological importance as a demonstration of the extended reach of Australian air power throughout the second half of last century.

Switching the focus back to other events taking place in 1950, no sooner had the RAAF begun its commitment in Malaya than the Korean War started. The decision to commit a fighter squadron was pure happenstance, based on the fact that the last Mustang unit with BCOF (British Commonwealth Occupation Force) was about to end its tour in Japan and return home. A week after fighting began just across the Korea Strait, RAAF Mustangs had joined in the air war there. The provision of a single air fighting unit, backed up by a transport element, was never going to be seen as more than a mere token of Australia’s support for the United Nations position in this conflict, nor was it going to be a war-winning contribution entitling Australia to a say in how air operations would be conducted within the theatre.

In fact, had the coincidence of timing been slightly different, it is possible, even likely, that no fighter squadron would ever have been sent. After all, back in Australia the RAAF’s fighter wing was in the process of converting to the de Havilland Vampire jet, and the RAAF’s Mustangs had been handed over in 1948 to the Citizen Air Force squadrons to operate in the intercept fighter role. Had Australia not had No
77 Squadron on hand in Japan when the war began, then we must wonder what the RAAF contribution might have ended up being, especially once it became clear that the commitment was not going to be short in duration. For example, the strain of committing transport support to Malaya and Korea simultaneously was to cause a reallocation of resources between theatres. So what combat elements would the RAAF have decided it could spare—if it had had to make an allocation from back in Australia?

As it was, the story of the RAAF’s participation in Korea has been dominated by the drama experienced over its need to re-equip 77 Squadron within six months of the conflict beginning, and the adequacy of the British-made Meteor Mk 8 jet (which replaced the Mustangs) in combat with the advanced MiG-15s taking to the Korean skies from late in 1950. The RAAF would have preferred the American-built F-86 Sabre, but the USAF needed all these aircraft coming off production lines for itself. When the inadequacies of the Meteor against the MiG-15 became apparent, the RAAF had to be content to adopt a ground attack role for the remaining years of the war.

To be frank, the RAAF as a whole got little out of the experience of Korea. Only a small proportion of its personnel got involved, and the bulk of the Service was more concerned to get on with the other purposes that Air Force was meant to fulfil. One point that clearly stands out concerns how unprepared 77 Squadron was when it came to mounting intensive air operations, apart from its flying standards. After four years of routine occupation garrison duties, the unit’s thinking and preparedness had not advanced beyond the experience of World War II. While the ground war did, in fact, resemble conventional operations from five years earlier, the air war took a step jump once the MiGs appeared on the scene. The technology difference between the Meteor and the MiG is only part of the equation. The debate still rages over whether the RAAF rushed its conversion into the jet age, whether the Meteor—although inferior in some respects—could still have given a more creditable account of itself, had the RAAF given time and attention to developing appropriate tactics and training.

The obvious fact also remained that here was the RAAF working in partnership with its two main friends and allies, as part of a multinational military undertaking. The logic for this was inescapable, especially bearing in mind the prevailing belief that Korea was probably but a foretaste of a new world war. The thinking in the Menzies Government that had come to power in Australia at the end of 1949 was that there was likely to be a dramatic ‘hotting up’ of what had been a ‘cold war’ since the Soviet attempt to blockade Berlin just a year or so earlier. It was concern on this score that produced significant changes in Australia’s defence arrangements. RAAF strength was expanded to 15 000 personnel and 16 squadrons, and the passage of a National Service Act in 1950 introduced conscription for all three armed services the following year, which stayed with the RAAF until 1957. Defence planning developed in this period also envisaged that, should a new global conflict occur, Australian forces would take their place in helping Britain to defend the Suez Canal.

This explains why, at the same time that RAAF units were engaged operationally in Malaya and Korea, Australia (and New Zealand) both consented in 1952 to
British proposals to make available Vampire fighter units to join in garrisoning the Mediterranean, essentially guarding the NATO flank in southern Europe. The half-strength fighter wing that the RAAF maintained at Malta stayed until 1955 as a visible demonstration of Australia’s willingness to shoulder a burden of world policing that extended well beyond its own narrow region. Air power was the medium chosen to make this happen.

Even once the Malta aberration was ended, the RAAF still found itself called upon to act like a global air force on still more occasions during this period and over the next few years. In mid-1956, for example, five RAAF Canberras were sent on a goodwill mission to assist the USAF to celebrate Armed Forces Day. The very next year, three Neptunes embarked on Operation Westbound, which entailed circumnavigating the globe while representing Australia at the independence celebrations for Ghana, in West Africa. Three years later, in mid-1960, three Canberra bombers and a Hercules transport undertook Operation East Bound, which meant circumnavigating in reverse to provide an Australia official presence at independence celebrations in Nigeria. Obviously, these were not warlike operations, but they reaffirmed the utility of air power in furthering non-military aims and policies of the Australian Government.

This lesson had been well and truly made by the early 1960s, when the US and some of its allies, including Australia, began the drift towards intervention in the growing counterinsurgency conflict in Vietnam. This was, I suggest, the first example of Australia being a member of a ‘coalition of the willing’ (with Thailand, the Philippines, South Korea, Taiwan, Spain, and New Zealand). I mean no disrespect to the men and women of the three Australian Services who fought in Vietnam when I say that the detail of what happened there matters less now than what the Australian (and specifically RAAF) presence was meant to represent. Australia’s contribution was never meant to win the war, and none of the secondary partners enjoyed a significant voice in shaping the strategy for dealing with the conflict. While it was hoped that allies could help to influence the security situation in the local areas in which they operated, their presence was valued primarily for demonstrating that the US was not acting alone in attempting to resolve South Vietnam’s predicament.

This aspect of symbolism explained the incremental manner in which RAAF participation (indeed, the whole of Australia’s involvement) came about. It began with an Army training team in 1962, expanded with a beefed up team and the first RAAF element (a transport flight of Caribous) in 1964; followed by an Army battalion in 1965, then a two battalion ‘Task Force’ (Brigade) supported by a RAAF helicopter squadron in 1966; finally a third Army battalion to beef up the Task Force plus a Canberra bomber squadron in 1967. The commitment remained until a steady withdrawal commenced in 1971. At the height of the RAAF presence, personnel numbers reached about 770. It was not a huge commitment in an air force which grew in 1964–69 from 17 500 to 24 000 personnel. And it was certainly not Australia’s involvement in Vietnam that drove the RAAF expansion in this period.
The reality is that, at the very time we went into Vietnam, the big concern shaping Australian defence thinking was a concern that a regional conflict with a bellicose Indonesia was a distinct possibility. As I expect we will hear this afternoon, this factor lay behind the large-scale re-equipment program that the RAAF embarked upon during the 1960s, and shaped many of the new aircraft acquisitions made in this period. The appearance in Indonesia’s air order of battle of Soviet-sourced aircraft like the MiG-19 jet fighter, and the Il-28 light jet bomber, led to Butterworth being placed on stand-by during the ‘Confrontation’ period, and preparations made for the air defence of Darwin. But it was only a passing phase, and by 1966 the danger was discounted almost entirely.

By the time that RAAF Canberras were dropping their last bombs in Vietnam and preparing to return home, Australia’s strategic landscape had altered totally. There were no more major threats to be considered in our neighbourhood, and policy planning had contracted to talking notions of ‘fortress Australia’ while eschewing ‘forward defence’.

So what can be made of the RAAF’s war-filled three decades, the 40s, 50s and 60s. After World War II, it was a diminishing pattern of muted (even though sometimes deadly) conflicts in far-off places that generally failed to engage the interest of the Australian people. Coming hard on the heels of World War II, the public hardly cared about what was happening in Korea (the ‘Forgotten War’). It was only in the last stages of the Vietnam conflict that Australians began voicing active opposition to Australia’s presence. In neither of the last two cases were vital Australian interests at stake, merely the desire for Australia to be seen as doing its bit for wider alliance and partnership arrangements, including support for UN peacekeeping, the ANZUS alliance, ANZAM (or what became the Five Power Defence Arrangements) or even SEATO. This is a trend that remains visible in much of what Australia and the RAAF does even today.

For the RAAF, the three wars were important, and necessary, steps along a path of bringing the Air Force to maturation. The dramatic highpoint of World War II was followed by lesser but still demanding situations which provided necessary impetus towards addressing aspects about the RAAF’s set-up that needed development and improvement. In that sense, the conflicts of the 50s and 60s, both actual and potential, forced the RAAF to begin thinking and acting like a serious and professional air force. It was time to add substance to the capacity to demonstrate the global reach of air power.
Chief of Air Force, former Chiefs, distinguished guests, ladies and gentlemen, at the RAAF Museum we look after all those pieces that you people get rid of at the end of the day. I must admit, when I was asked to give a presentation today I was quite honoured, it being the 90th anniversary of the Royal Australian Air Force, and we have had a fairly busy year at the RAAF Museum telling the public about that. So I thought I would highlight how well the 90 years of the Air Force is reflected and what the RAAF Museum has done and is doing to preserve that heritage. To achieve this I will go through the changes that have been effected in the Museum over the last 15 years.

The Museum came into being in 1952, about the time of Gwen Meredith's radio serial, Blue Hills.¹ Does anybody not know what I’m talking about, Gwen Meredith’s radio serial? Because I found out half my staff did not. Of course, Australia was a very different place at the time of Gwen Meredith’s serial and ‘the evocative theme spoke to that idyllic and secure country place where Australians metaphorically travelled’ and ‘shared fantasy,’ and ‘it was a fantasy build on certainty.’² But the great Service we are now, the Royal Australian Air Force, is not built on fantasy but on certainty. We have got the conviction of professionalism and excellence, innovation and improvement and, of course, the Museum is charged with the sometimes unenviable task of preserving that heritage, which emanates from the strong foundations of our past generations. We at the RAAF Museum, of course, realise that we are not up there with the force capability stakes but we have got a job to do and it is a fairly important job; that is to collect and preserve our Service’s rich heritage.

I suppose it would be reasonable that you would expect that Sir Richard Williams had something to do with the Museum because he appears to have had something to do with just about everything connected to the establishment of the Royal Australian Air Force in the early days. Apart from being our first military aviator to get his wings, he was the first colonial to command the Royal Air Force Wing in the Middle East, he was the first Chief of the Air Staff, he did the first overseas aerial survey, and the list goes on and on.

¹ Editor’s Note: Blue Hills was an Australian radio serial about the lives of families in a typical country town. Written by Gwen Meredith, it ran for over 27 years from 1949 to 1976, comprising 5795 episodes, and was at one time the world’s longest-running radio serial.

While I am on Williams, I will just digress for a moment. As I said, Richard Williams was the first pilot and, believe it or not, about 75 years later Robyn Williams (no relation) was the first female pilot in the Air Force—just a history lesson, that is all that was.

As I mentioned, it would be reasonable to expect that Sir Richard had something to do with establishing the Museum but, as it happens, this honour belongs to George Jones, the then Chief of the Air Staff. While some elements of the Air Force were critical of his actions during and after World War II, one must give him credit for ensuring the preservation of the heritage of the second oldest Air Force in the world.

At the time of inauguration in 1952, there was no consideration given to a formal display open to the public or to museum operations such as conservation, restoration and preservation; rather, we were just a repository for items of the Australian Flying Corps and Royal Australian Air Force relating to notable personnel, and items of technical and historical significance. As the collection developed between 1952 and 1966 there was a need for organisation and custody, which warranted the appointment of a full-time curator in 1966. This post was supported by a full-time assistant in 1971 and efforts were concentrated on establishing the small display which opened in that year to celebrate the 50th anniversary of the Royal Australian Air Force.

In 1986, a full-time officer in charge was appointed and he was to coordinate the Museum. The establishment reflected not only the Service’s, but also the public’s expectation of the need to exercise professional management across a broad range of curatorial, administrative, restoration and operational activities. Now, John McCarthy was saying how the RAAF ‘staggered around’ in the early days; well, the Museum staggered around in the early days too. We were subject to a lot of administrative control by units at RAAF Point Cook and Laverton until the Museum was actually formed as an independent unit of the RAAF in March 1988, with a role to collect and preserve RAAF heritage. From then on things started to improve slowly. We are situated at Point Cook, and why Point Cook? Well simply because it is the spiritual home of the RAAF and it was the first and only RAAF base from 1921 through till 1925, when expansion saw the Service spread its wings to Richmond and Laverton.

Apart from the other training activities, flying training remained at Point Cook until December 1992 and the base witnessed the ebbs and flows throughout the years, peaking during World War II and again during the Vietnam War. After Vietnam, activities on Point Cook slowed, and Defence Reform reviews commenced and Point Cook was ‘on the radar’. Base operations started to wind back, including the main activity, flying training. Once that ceased, the support elements were no longer required and the next critical phase of the base history was that Point Cook was listed for disposal. That decision was overturned politically in November 2005 and base activities are slowly being re-established, with the Museum remaining and other units are slowly moving around us.
Although this could be seen as the base’s decline, the cessation of flying activities at Point Cook proved a bonus for the RAAF Museum. The former No 1 Flying Training School (1FTS) facilities were offered to the Museum and we were at a crossroads. My first job in planning the future of the Museum was to decide what it was that the Museum wanted to achieve. Initially, my view of Point Cook centred on the important task of thinking about the future of the past. The RAAF heritage collection is a large, complex and interesting collection, and it has to be displayed in an evocative and experiential way that allows the Museum visitor to learn about the past and make connection between that past and the RAAF’s contemporary operations. Additionally, we needed ‘bums in seats’; otherwise the whole effort to display and promote the heritage is wasted.

A look at any modern, product promotional theory reveals a number of common threads to consider when figuring a successful strategy and foremost amongst these is the need to sit down and determine what makes your particular institution unique. For it is this unique nature of the attraction that effects the ‘pulling power’ or the ‘distance pull’ of that institution; that is the distance and trouble people will go to come and see what you are doing. For the RAAF Museum, the unique feature is a singular theme—the history of the Royal Australian Air Force—and, of course, the ‘pulling power’ is the aircraft. There are out there aficionados who get a kick out of seeing and being up close and personal with rare and exotic aircraft. Grab them and the rest will follow, but of course not by excluding the more general visitor who makes up the bulk of our audience.

Whilst the aircraft have the pulling power, the key to the Museum’s future rests with public education; telling the story of the RAAF’s place in society and the need to observe the interaction of its personnel and their environment. Therefore, the Museum chose to focus on the new display of the human face of the RAAF’s proud history. It had to be elastic, dynamic and mainly remain accessible to the population, broadening and disseminating the culture of the Service.

In 1994, with new direction, I commenced planning and designing the new gallery which replaced the patently unsuitable building that had gloomy rooms crowded with memorabilia, displayed indiscriminately and often with incomprehensible interpretations epitomising museums of the 18th and 19th centuries. If it was not an aeroplane, a senior officer’s uniform or foreign military memorabilia, it just did not get displayed.

The old Museum had a great number of loaned artefacts and aircraft, whilst thousands of our own items—RAAF-owned and significant articles—lay in storage. This was one element which I reversed, to much bloodletting of the people that had their stuff on loan—it was free storage for them. So we turned it around and now have our own gear on display. Those of you who knew the crowded and the cluttered displays of the old buildings will notice how everything has been renovated and how it has changed.
This next slide shows what the Air Force looked like in 1914. With the current SRP, we will probably look like that again in another couple of years! The Air Force will get smaller and the Museum is going to get bigger.

Obviously, as a military museum, the RAAF Museum deals fundamentally with the military experience and well you may ask, ‘Why have a museum when we have the Australian War Memorial?’ It is a question we get asked a lot. The RAAF, as well as the Army and the Navy, have a duty to preserve their own heritage and of course the RAAF Museum is charged with the responsibility of doing that for the RAAF.

The RAAF Museum is primarily different to the War Memorial and we do not compete with it. While both institutions collect data facts of associated wars and conflicts, the RAAF Museum also collects those items relating to the other ingredients of Service life, such as research and development, training, social elements, sporting activities, documentation and non-conflict related activities which are a big part, but less identifiable functions, of Service life. We do not concentrate solely on Air Force actions in times of conflict, which after all are the dramatic high points and hence engender collections, but these actions do not interpret the whole human experience of Service life such as peacekeeping and monitoring and civil aid.

In the last 10 to 15 years there has been a dramatic change in the global, political and strategic profile, and the RAAF Museum must adapt continuously to these changing
requirements, interpreting the new displays to reflect the contemporary situations in which the RAAF participates. This is an essential task of the Museum as the means to encourage the development of historical awareness among not only the visiting public, but our own personnel as well.

The Heritage Gallery was constructed in the former 1FTS buildings. Renovations of the internals of the building started in January 1996, with the official public opening taking place 10 months later to celebrate the 75th anniversary of the Air Force. We have done the 50th and the 75th so hopefully, fingers crossed, my last slide at the end will show what we should have for the 100th anniversary of the Air Force.

It is all well and good for the people in blue suits; we know what the Air Force is about. When we go into there, we tend to turn off and when I do have official visitors from the Air Force they look and say, ‘Ho-hum.’ Well it is not ho-hum, this is what we do and it is to the public to whom we are primarily talking. The gallery consists of about 560 square metres and provides a dynamic delivery of information to the visitor, and the display is an equally important element to the Museum as is the task of collecting.

We have a mandated requirement for a robust collection management system and the RAAF Museum consists of thousands of items relating to all periods of military aviation from 1914 through to the present time.

In 1991, I identified that the collection management system in the Museum was rather rudimentary, so we developed a new system which was accepted by the Service and it is still in use today—I notice the Army are using it now too; so they picked something up from us. The Museum collects objects which have a connection with an individual, historic event or where a piece of equipment has had a major impact on the Service. Additionally, the collection of objects must be consistent with the criteria laid down in the RAAF Museum acquisition policy. Objects are acquired principally from the Service or by donation from serving or ex-Service personnel, their families or private individuals. Where they are not available by donation and are deemed significant enough for inclusion in the collection, we acquire by purchase or by exchange from appropriate sources. Objects will only be purchased after all avenues of exchange have been exhausted.

For any ‘loggies’ (logisticians) here—we used to call them ‘equipos’ (equipment officers) in my day—this next slide shows the fabled ‘box.’ I remember when I was a ‘techo’ (technical officer), you would go and order an item and they would say, ‘No, you can’t have it, there’s only one left on the shelf and we’re keeping it for somebody who might need it.’ We finally got it in the collection and there it is. We do not know what it is; it is still in its waxed wrapper but there it is. So for all those excuses that you loggies use, you cannot use that one anymore. We have it. Send them to the Museum if they cannot get it.

We have a research archive which houses, apart from a considerable array of documentation and log books, a photograph collection of over a million items, as well as documents, maps, posters and other paperwork related to the history and
operations of the Australian Flying Corps and the Royal Australian Air Force. We hold in excess of 10,000 general and technical publications which are unique to Australia. In recent times the Museum has assumed the role of preserving all the images taken by RAAF photographers and this includes preserving in excess of three million negatives taken prior to the advent of the digital camera, and they are from all Air Force sections throughout Australia, including Butterworth.

In the collection we have an aircraft inventory that totals 80 aircraft of 50 different types; maybe in the next war we will be able to get them out just like we did for World War II and Vietnam. The aircraft restoration and maintenance workshop is integrated into the Museum’s itinerary and the workshop is open to the public and it enables the visitors to be able to appreciate the ‘behind the scenes’ activities of a working museum.

We receive 120,000 visitors a year and that is an appreciable increase on the old displays which only pulled in about 20 to 25,000 people. We have a permanent staff of 24 full-time personnel—there are 23 APS (Australian Public Service) and one PAF pilot—and we are supplemented by eight Active Reserve personnel (six pilots and two techos). To complement the small workforce, the Museum has a very strong corps of volunteers who work in all areas except administration, and I will emphasise here that the Museum could not function without the assistance provided by these enthusiastic and dedicated volunteers. They give us the equivalent of an additional 10 staff members per year. They work as technical volunteers, host officers, guides and in any other jobs we give them.

Although much has changed in the past 15 years within the Museum, particularly the display of heritage items, the need for conservation has not diminished. When I came to the Museum in 1986 the field of conservation was relatively unknown in the Museum and, indeed, in the Air Force. It was obvious that this unique collection had to be safeguarded if it was to survive, but it had to remain accessible to the public. The balance between protection and accessibility is one of the challenges of conservation. In the early days of the Museum, conservation was only focused on airframes, and primarily on restoration and treatment. Our society is increasingly diverse and issues of identity and culture have entered our mainstream daily lives and duties, and if we do not recognise the culture of those items of importance which make up this society there will be a huge void in our history which will be evident to future generations. So, in response to these changes, conservation has evolved from a restoration ethic to one that promotes preventive conservation. Whilst the Museum is riding on a wave of increased visitation due to the great display and the product we have at Point Cook, I must ensure that our resources are not totally directed towards exhibits, restoration or flying activities and neglect conservation. I must point out here that this element of conservation is not viewed as a luxury but as a necessity.

I mentioned earlier the unique feature is our singular theme, the history of the Royal Australian Air Force, and our pulling power is the aircraft. Of all the items in the Museum that project the evolution of the Service, it is the aircraft and they are the most visible demonstration of this evolution.
For those of you ladies and gentlemen who have experienced ‘death by video,’ associated with your recruiting or during your training days and sat through the bestseller of them all—Box Kite to Swing Wing—you can relax; it has been put to bed.\(^3\) It now belongs to us and here they are: the video, the box kite and the swing wing are now in the RAAF Museum.

The box kite actually will be flying for 2014—we are working on it as a flying model. However, I do not think the Chief is going to let us fly the F-111; I doubt we could afford it anyway. The aircraft displays exude the aura of invincibility and undeniable physical grandeur, from the most basic flying machine such as the Deperdussin or the box kite to our latest acquisition, the F-111. The aircraft, along with the engines, the weapons and the ejection systems, are the main components and the characteristics reflect the enormous progressive technical change in the past 90 years, and we are able to show them.

For the pilots, they have an ejection seat today. They keep talking about this ‘modern’ ejection seat but ejection seats have been around since 1913. There it is in this next slide, in the Deperdussin: you hit the ground and it throws you out!

It is interesting to note that, in the span of one man’s lifetime, mankind has gone from barely lifting off the ground to setting foot on the moon and sending investigative tools incomprehensible distances into space. Ironically though, after the Wright Brothers worked so hard to put a human in the air, today’s aeronautical engineers are working hard to eliminate the human in the air with the advent of UAVs (uninhabited aerial vehicles), so we are quite strange people at times.

We have many aircraft at the Museum; I will not go through them all, otherwise we will be here all afternoon. We have the slow ones, we have the fast ones, they have hovered and they have alighted on water. They represent the elements of technology from the flimsy wooden constructions of yesteryear to the latest advanced composite materials. They were the cutting edge in their time and perhaps controversial, but they tell the story of the evolution of the Air Force.

An additional bonus for visitors to the Museum is the innovative and popular interactive flying program that is conducted each Tuesday, Thursday and Sunday. We use five of our own aircraft, which are airworthy, and they are supplemented by several approved, civilian owner-operator associates who come in and do it for us. The public program plays a significant role in allowing the Museum to preserve that living heritage by retaining examples of technology items in full operational state, and demonstrating them in an operational setting. There are pros and cons and, while operating exhibits involves a risk of losing forever the intangible legacy associated with them, it also preserves the knowledge associated with the practice and maintenance of the operations.

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\(^3\) Box Kite to Swing Wing was a video recording made in 1977 for Defence Public Relations. It traced the history of the RAAF from the original AFC in World War I through to the 1970s.
So that takes us to the end of the first 90 years, but what of the future? The next decade will see additional aircraft, including the C-130H, the F/A-18, the P-3 and the PC-9 come to the RAAF heritage collection, along with a myriad of other technical equipment of smaller items. The existing challenges will continue to require attention and, undoubtedly, these issues will challenge our knowledge and our resources. Now, it is clear to any observer that the most significant challenge facing the Museum is space, and here I am talking about space on the ground; the space for storage and display. Space for the increasingly large number of aircraft types is already at a premium and planning is underway to address this demand. So, tied to the redevelopment of Point Cook, the RAAF Museum Enhancement Project aims to provide a 6500 square metre display facility to complement the existing buildings and to make more of the RAAF heritage collection accessible to future generations of Australians.
Air Marshal Brown, former Chiefs, ladies and gentlemen, good afternoon. The phenomenon of unintended consequences is often related to warfare and, in particular, to disastrous outcomes. Thus, World War I was supposed to be over by Christmas 1914 but instead lasted four years and resulted in the deaths of 59,000 young Australians. Similarly, Vietnam was going to be quickly won by Western know-how, firepower and wealth, but 13 years later 60,000 young Americans and two million Vietnamese were dead, the United States had been severely damaged politically and socially, and the war had been lost. And it will be years before we know the full consequences of the West’s continuing so-called Global War on Terror. In short, the history of unintended consequences contains a salutary message for our political and military leaders.

Unintended consequences are not, however, a one-way street. The American sociologist who formalised the notion, Robert Merton, identified three kinds of unintended consequences, as follows:

- Perverse effects contrary to those intended; that is when an intended solution makes the problem worse. The Global War on Terror may be an example.
- Negative or unexpected effects, which occur in addition to the desired effect.
- Positive or unexpected benefits.

Merton’s template offers a useful model for examining the Air Force in the 1960s, a time when the RAAF experienced its greatest re-equipment program since World War II, and also deployed three operational squadrons and substantial support services to the American war in Vietnam. Either of those two powerful shaping forces would have been sufficient in itself to affect the Air Force profoundly; in combination, they generated rapid growth, a technological revolution, and fundamental institutional change.

The re-equipment program was remarkable. Inside a 10-year period, the RAAF was engaged in introducing into service no less than 20 different aircraft types.

At one end of the spectrum that engagement was relatively routine, as in the air worthiness role associated with Royal Australian Navy aircraft such as the A-4 Skyhawk, the S-2 Tracker, and the Wessex helicopter. At the other end, with aircraft such as the Mirage III, the P-3, the F-4, and the F-111, there was nothing less than a generational change, as Air Force capabilities and technologies were shifted to such
an extent that substantial changes were demanded in a range of operational concepts, personnel recruitment and management, and logistics practices.

Equally revolutionary was the capability introduced with the UH-1 and CH-47 helicopters—the first operational rotary wing aircraft in the RAAF’s history. If that were not enough, the MB-326 Macchi was intended to introduce single-type pilot training for the first time in more than half a century of Australian military aviation. But there’s more.

Turning to airlifters, the introduction of the Caribou, the C-130E and the HS748 finally brought the C-47 era to an end, at least at the squadron level; while the Viscount, the BAC-111, and the Falcon 20 moved VIP operations into the turbojet era. And while SP-2H maritime patrol aircraft and Alouette helicopters may not have redefined existing capabilities, their acquisition nevertheless had to be accommodated in an already very busy agenda. Also on that agenda were Bloodhound surface-to-air missiles and their complementary Hubcap controlling and reporting unit radars. And finally, Army aviation was still heavily dependent upon the RAAF for much of its staffing, training, operations, and logistics. Thus, the introduction of Sioux helicopters and Pilatus Porter liaison aircraft were yet other demanding tasks for the Air Force to manage.

As a consequence of that exceptional re-equipment program the RAAF was exposed to a very wide range of aircraft manufacturers. Furthermore, those manufacturers came from six different countries that spoke four different languages. This complexity, which to some extent was self-inflicted, brought with it self-evident difficulties. Since the 1960s there has been a trend towards acquiring aircraft primarily from Australia’s major allies.

The implications of the re-equipment program cannot be understood, though, simply through lists of aircraft types. The issue here is my previous reference to generational change. Most of the RAAF’s new aircraft were replacing types that technologically were a legacy of either World War II or the transonic era. The avionics and weapons systems in the superseded Sabre fighter and Canberra bomber, for example, were old-fashioned in the one instance, primitive in the other. The same thing could be said about airframes, engines, and flight control systems. By contrast, the F-111, the F-4, and the Mirage were all supersonic, and the airframe of the F-111 in particular was extremely advanced. Furthermore, those aircraft types, together with the P-3, catapulted the Air Force into the enormously challenging domain of computers, automatic and integrated avionics, and flight control systems that think they know more than their pilots.

Some of the unintended consequences of the acquisitions of the F-111 and the Mirage were particularly noteworthy, being both positive and negative.

The F-111 was the single most important weapons system the Australian Defence Force has operated since World War II. With its long range, high speed, unique penetration capability, and precision weapons, the F-111 was Australia’s first genuine strategic strike and power projection capability. From that perspective, it exceeded
expectations and therefore generated a positive unintended consequence. However, its influence on maintenance, indeed on RAAF logistics generally, was much more problematic.

Air Force policy was to maintain the F-111 entirely in-house, as a means of retaining deep level technical, logistical, and management skills within the Service. In the event, implementing that policy almost brought the RAAF to its knees when the F-111 turned out to be vastly more difficult to maintain than envisaged. For a considerable number of years, keeping sometimes only two or three F-111s on line from a fleet of 24 came at enormous cost in terms of staffing, spare parts, maintenance hours per flying hour and, most regrettably, workforce health. No-one imagined that 44 years after Australian crews first flew the F-111, the tragic unforeseen consequences of the fuel tank deseal/reseal program would still be the subject of litigation. By the same token, it should be acknowledged that the F-111’s maintenance challenges led to positive unexpected outcomes. It was characteristic of the RAAF that, through persistence, hard work, and the efforts of a high-quality workforce, the difficulties associated with a complex system were overcome and eventually raised the Air Force’s technical competence to a new high level.

The Mirage fighter also challenged the RAAF technically, but in a different way. Designed by the Dassault company primarily as a high-altitude interceptor, the Mirage was used by the RAAF in a wider range of air defence profiles, as well as in the strike/reconnaissance role. The imperative to make the Mirage more flexible required the Air Force to modify it to carry a greater range of weapons and sensors than its designers had intended. On the one hand, the associated work consumed resources and man hours; on the other hand, it also required precisely the kind of in-house research, development, test and evaluation that has been one of the hallmarks of a world-class Air Force since World War I.

Before turning to the second main shaping force on the RAAF during the 1960s, namely, the Vietnam War, I should highlight a different kind of re-equipment program (if I can use that description here) that has had a profound effect on Australian defence.

My reference is to the strategic airfields built across the country from the Pilbara to Cape York. The idea of building bases to protect Australia’s vast western and northern approaches originated with Air Marshal John McCauley when he was Chief of the Air Staff in the 1950s. Cocos Islands and Momote in Papua New Guinea were upgraded by RAAF Airfield Construction Squadrons during the 50s, but McCauley’s vision really took flight with the development of the first mainland airfield at Tindal, south of Darwin, in the 1960s. By this time, the RAAF’s Chief was Air Marshal Fred Scherger, who envisaged Tindal as an unmanned operational base capable of supporting the most advanced aircraft types. There would be high-quality movement surfaces, essential infrastructure such as water and electricity, and very little else. Other facilities would be moved in by air or truck as needed.

Scherger’s concept was well suited to a small air force with a huge, largely underpopulated, largely under-serviced continent to defend. Completed in 1967,
Tindal was to become a prototype for three more strategic air bases across the north of Australia, the last of which, fittingly, has been named after Scherger.

The key units in the ultimately successful sagas of the F-111 maintenance and the strategic air bases were No 3 Aircraft Depot and Nos 2 and 5 Airfield Construction Squadrons respectively. It seems noteworthy that none exists today. The case of No 3 Aircraft Depot is especially interesting, given the frequently expressed concern of recent years that cutbacks in personnel numbers have turned the ADF into a hollow force; that is, into a force that skates on the edge of sustainability, particularly during extended periods of high operational tempo. No 3 Aircraft Depot was disestablished in 1992, the casualty of a seemingly interminable succession of government-initiated Force Structure Reviews, Commercial Support Programs, outsourcing, and similar euphemisms, all in the name of alleged efficiency gains. No 3 Aircraft Depot may not have been a front-line unit, but it provided a pool of about 700 highly skilled uniformed technicians, who could be deployed to operational squadrons at short notice. My point here is that maintenance policy made in the 1960s gave the Air Force exceptional in-house technical depth and flexibility for 30 years.

I now want to turn to the war in Indochina. Any commentator searching for a textbook example of unintended consequences would be hard-pressed to find a more graphic model than the American war in Vietnam, which was the second major shaping influence on the RAAF during the 1960s. We can start by discussing the war’s effect on the RAAF’s management of the re-equipment program I have just outlined.

‘An air force without bombers,’ Chief of the Air Staff Sir Donald Hardman had told the Air Board in 1954, ‘isn’t an air force’—a conviction that was held just as strongly by his successors. Air Marshal Hardman had a good point, but in the 1960s it needed thoughtful application. Instead, it can be argued that the RAAF’s hierarchy spent too much time thinking about the introduction of the F-111 and the Mirage and not enough time thinking about the war in Vietnam. Two of the RAAF’s three squadrons in Vietnam did not rate on Air Marshal Hardman’s scale of what constitutes an air force. No 9 Squadron was operating Iroquois helicopters in support of the Australian Army and No 35 Squadron, initially known as RAAF Transport Flight Vietnam, was flying Caribou light transports as part of the US’s in-country air support system.

We can infer a good deal about the RAAF’s priorities from the manner in which both squadrons were sent to war. The first three Caribous to arrive in Indochina were actually on a delivery flight to Australia from Canada, but on arriving in Butterworth in Malaysia were told to turn left and to go to Vietnam instead. So hasty was that particular decision and so inadequate were the arrangements in Vietnam that for several weeks after their arrival unit executives had to meet essential expenses from their own pockets.

The shortcomings associated with No 9 Squadron’s deployment were ultimately far more damaging. Despite ample evidence in advance that the Iroquois crews would be operating in a high-risk environment and would be regularly exposed to enemy fire,
only two of the eight helicopters were fitted with armoured seats, none had door gun mounts, and crews did not have chest protectors. According to squadron executives, in such matters as planning, staffing and support equipment, helicopter units were routinely given a lower priority than strike squadrons. Nor were the squadron's operational practices as responsive to the Army's legitimate needs as they should have been.

Consequently, the early months in Vietnam were characterised by bitter accusations and counteraccusations between senior Army field commanders and the RAAF. All of the problems were eventually resolved and No 9 Squadron came to be regarded as the best Iroquois unit in Vietnam. By then, however, the damage had been done. A generation of Army officers had become determined to gain control of the so-called 'battlefield helicopters' and embarked on what became a 20-year campaign to achieve that end. There have been few more controversial unforeseen consequences in RAAF history than the decision taken by the Australian Government in 1986 to transfer control of those aircraft from the Air Force to the Army.

Another less well-understood unintended consequence of the Vietnam War concerns the Air Force's institutional culture.

Vietnam was the first major conflict in which Australians had fought since the ANZUS Treaty was concluded in April 1952. (I am putting aside the Korean War here because that was already in progress when the ANZUS Treaty was signed and anyway, unlike the Vietnam engagement, Korea was endorsed by the United Nations.) In other words, Vietnam was the first occasion on which Australians went to war because of the need to pay a premium on the perceived security benefits of the ANZUS Treaty.

Three observations are pertinent here. First, for our politicians at least, participation in the war apparently was more important than the end result. To describe this attitude as questionable would be an understatement of the highest order. For those of you who might contest this point of view, let me remind you that in 1972, after 10 years of fighting and with no sign of victory on the horizon, Australia peremptorily withdrew all its forces, effectively abandoning its South Vietnamese allies.

This leads to my second observation; namely, that unlike World War II, Vietnam was not a war of necessity but a war of choice. This profound ethical demarcation has continued to characterise Australia's wars in the ensuing 40 years. It seems reasonable to suggest that this attitude would have affected our military culture. For example, it seems to have made the notion of developing and implementing an independent national military strategy redundant. Indeed, since the 1960s, in lieu of a military strategy, we seem simply to have had a policy of contributing token forces to the current American 'war of choice'.

My third and final observation concerns people. In combination with the re-equipment program, the Vietnam War led to far-reaching changes in staffing levels, training regimens, and maintenance philosophies.
Operational tours for individuals in Vietnam were normally set at 12 months. Because most members of the Air Force were signed up for periods from four to 12 years—that is, unlike draftees, they could not be discharged when they completed a wartime tour—either multiple tours had to be introduced or more people had to be recruited. The Government and the Services chose the latter approach. Consequently, between 1960 and 1969 the strength of the Permanent Air Force rose from 15,500 to 21,000, an increase of almost 40 per cent. Growth on that scale inevitably generated major challenges, including recruiting enough people of suitable standard and then ensuring they were properly trained, housed, fed, clothed, socialised etc.

The main issue, though, was achieving the right balance between numbers and quality. The mid-1960s marked the post–World War II high point for ground staff training as, in combination, the re-equipment program and the Vietnam War trebled the demand for technical staff. By 1966, the number of trainees at the RAAF School of Technical Training at Wagga had grown from 600 to 1800. Accommodation blocks had to be fitted with double bunks and some instructors found themselves rostered for 37 lecture periods a week.

More technicians meant that more managers—that is, professional engineers—were needed. In 1961 the RAAF's premier officer training establishment, the RAAF College, had been renamed the RAAF Academy and had become a degree-awarding institution. However, only a handful of its graduates were engineers, the majority being pilots. At the instigation of the Air Member for Technical Services, the admirable Air Vice-Marshal E.C. Wackett, the RAAF extended an existing arrangement with the Royal Melbourne Institute of Technology to educate Air Force engineers. As well as increasing numbers, the arrangement attended to the quality side of the equation by ensuring that 55 per cent of all RAAF engineers would be tertiary qualified. Several years later, trainee equipment officers joined the scheme. Known initially as the Diploma Cadet Squadron, the new unit was formed in 1962 in suburban Melbourne and quickly became a major success story. The original estimated annual output of 18 officers was rapidly expanded as Diploma Cadet Squadron grew with the Air Force. By 1964, the student population had grown to 75 and by 1968 to 121. Thirty years later, almost 20 per cent of the RAAF's total number of air commodores were Diploma Cadet Squadron graduates.

The same external pressures that demanded changes to the Air Force's approach to logistics management also affected the pilot training system. Throughout the 1950s the number of pilots produced annually remained around the mid-thirties. That comfortable situation collapsed with the demands of the 1960s. Pilot numbers suddenly became the most critical staffing limitation on the RAAF's expansion campaign. In January 1964, the annual graduation rate was raised from 38 to 46, in May to 50, and by July the following year to 66. By 1968, the requirement had reached 100; that is, it too had trebled.

The work rate at the Flying Training Schools was hectic. In the mid-1960s, a Category C flying instructor on Winjeels at Point Cook could expect to fly four sorties a day,
day in, day out, week in, week out, with the total rising to six if night flying were programmed. But simply increasing the number of trainees was not the whole answer. Standards had to be maintained and, anyway, the system could not be changed overnight. Other actions taken to try to hold the line included withdrawing pilots from ground duties, borrowing QFIs (Qualified Flying Instructors) from the Royal Air Force, and recruiting experienced pilots from Britain, Canada, and New Zealand. Efforts were also made to reduce the loss rate of qualified RAAF pilots.

While standards at the Flying Training Schools were not lowered, those relevant to meeting the obligations of being a commissioned officer in the RAAF were. For example, the criteria for gaining permanent commissions or for renewing short service commissions were ‘relaxed to the minimum acceptable level of performance’; and extensions of short service commissions beyond normal retirement ages were offered.

Within three years the number of new pilots entering the Air Force was getting close to the 100 needed each year. Trebling the output was a very significant achievement for a small air force which was not formally on a war footing, even though it was fighting a major war.

I want to round out my presentation by mentioning notable people and events that helped define life in the RAAF during this defining period of change. First are the two most significant personalities of the period, Air Chief Marshal Sir Fredrick Scherger and Air Vice-Marshal Ernie Hey.

Scherger has been the RAAF’s outstanding Service head since World War II. Intelligent, shrewd and gregarious, he was above all skilled in the political domain. Although his tenure as Chief of the Air Staff ended in 1961, he became Chairman of the Chiefs of Staff Committee for five years and continued to influence all major Air Force decisions. No-one was more pro-American in his outlook, and no-one did more to support the war in Vietnam and the acquisition of the F-111 than the popular ‘Scherg’.

Pictured as an air commodore in the group photograph (centre of front row) in this next slide in a distinctive Australian uniform and a distinctive Australian pose, Air Vice-Marshal Ernie Hey was the Air Member for Technical Services for the entire decade of the 1960s. His exceptionally long tenure, allied with his fine intellect and unrivalled corporate knowledge, made him a formidable figure during Air Board deliberations, frequently to the discomfort of some of his less capable general duties colleagues. Such was his institutional authority, his time as Air Member for Technical Services was later fondly recalled by members of the engineering fraternity as their ‘Hey days’. When the F-111 project encountered testing times in the late 1960s, it was Hey more than any other individual who managed the crisis with his professional expertise and strength of character.
Turning to organisational matters, two events seem particularly significant. The first was the relocation of the Department of Air from Melbourne to Canberra—a move that commenced in 1959 and was largely completed within three years. We would need another conference to discuss the full range of unintended consequences of that decision. The second event occurred in 1965 when, for the first time, permanent commissions were offered to members of the Women’s Royal Australian Air Force (WRAAF), which in those years was still a separate Service. Around the same period the prohibition on female members getting married was lifted, although married women were not recruited and pregnant servicewomen had to resign.

To finish up, some nostalgia in the form of RAAF Base Butterworth. Rebuilt by No 2 Airfield Construction Squadron, Butterworth in the 1960s was the key forward base for the Commonwealth Strategic Reserve, with a population of 1900 servicemen and women, supported by 1400 Malay civilians. The RAAF had a fighter wing, a bomber wing, fixed and rotary wing airlift flights, a control and reporting unit, a maintenance squadron, and a host of other supporting services. Operational activities included Konfrontasi with Indonesia in the mid-1960s, support for the Sabre fighter detachment in Thailand, and assistance for all Australian units fighting in Vietnam, only a couple of hours away by C-130. At a time when ‘British Australia’ was emerging from its monocultural past, for many Air Force families a posting to exotic Butterworth opened a window to the world.

Let me summarise.

The decade of the 1960s was one of the most significant in the RAAF’s history, as the Service grew in size by 40 per cent and experienced a generational change in capabilities and also, perhaps, in institutional culture. It was an environment in which high-level decision-making was even more challenging than usual. The unintended consequences, positive and negative, of some of those decisions still affect the Air Force today.
The Transforming Impact of the F-111

Air Commodore Mark Lax

‘An air force without bombers isn’t an air force!’ so stated Air Marshal Sir Donald Hardman, Chief of the Air Staff in the 1950s. Hardman, an RAF officer, was speaking in support of the recent purchase of the Canberra—Australia’s first jet bomber. Hardman had been appointed to fill the Chief’s position after Air Marshal George Jones retired, and he arrived at a time of air power in transition.

The late 1940s and early 1950s were heralded by the jet (or what has also been termed the supersonic) age, the nuclear age and the missile age. All three ‘ages’ would challenge the RAAF hierarchy to create and maintain a credible postwar air force at a time when budgets were rapidly shrinking and manpower scarce.

By the early 1960s, the Canberra was obsolescent. It could not fly at supersonic speed, it had no radar and little in the way of penetration aids, and was limited in bomb carrying capacity. So after a considerable hiatus and some indecision, the Menzies Government unilaterally ordered the Tactical Fighter Experimental or TFX off the plans in 1963. This election stunt would deliver a ‘paper aeroplane’ which would become known as the F-111.

The F-111 would, in time, prove a tremendous challenge to the RAAF, but what came as the first ‘shock of the new’ was numbers, or more precisely, lack thereof. Australia could only afford 24 aircraft, and this continued a worrying trend. In 1944–45, Australia had over 270 B-24 Liberator bombers to prosecute the last months of World War Two. In the late 1940s, these were replaced by 73 Avro Lincolns, a derivative of the famous Lancaster and within a decade, the RAAF had scrapped these and ordered 48 Canberras. The trend was clear—the more complex (and therefore expensive) the aircraft, the fewer Australia would acquire. The RAAF had to deliver a credible strike capability with an ever-decreasing number of platforms.

With the arrival of the Canberra, the RAAF had entered the jet age, but concerted attempts to enter the nuclear age quickly faded with the realisation of the tremendous cost of acquisition, the complexity of maintenance and security of the weapons, and a lack of political will on both sides of politics. The missile age arrived with the Sabre fighter and the purchase of the AIM-9 air-to-air missile. The Mirage fighter was shortly to follow. So, as Dr Alan Stephens has stated in the previous paper, the RAAF was already facing the challenge of far more complex aircraft coming into service around the same time. However, these would pale into insignificance with the challenges posed by the arrival of the F-111.
The B-47 Option
While Australia awaited the delivery of the F-111, the RAAF was offered 24 B-47 Stratojets as a loan, but the Air Board wisely rejected the USAF offer. The B-47 was a leviathan and already obsolete. Furthermore, it failed to meet 10 of the 16 operational specifications set by the Air Staff Requirement for the new bomber. More problematic, the aircraft required very long runways, its operating costs were high and to man the squadron(s) meant the closure of at least one Mirage unit and two Canberra squadrons as well. The final detractor was that aircrew and ground crew training on the B-47 would take over two years, by which time the F-111s were to have arrived.

The ‘Unique’ F-111
The US F-111A first flew in December 1964 and Australia’s first F-111C in July 1968, but while that was remarkable simply because of the short time to get the aircraft flying, it was also the start of the technical woes and schedule delays.

What was so unique about the F-111?
- The aircraft was the first to employ variable wingsweep in an operational role.
- It had two afterburning turbofan engines, also the world’s first of this type.
- The terrain following radar.
- An adaptable flight controls system.
- A crew module escape system rather than ejection seats.
- A fully integrated navigation-attack system.
- A suite of modern EW sensors and countermeasures.
- It was intended to be suitable for the USAF and the USN, the first ‘joint’ aircraft program.
- Capable of delivering a wide range of weapons.
- It was made of a remarkable new alloy called D6ac steel.

The ordering of the F-111 must have sent a shock wave through the RAAF once the hierarchy came to realise the enormity of the acquisition. The RAAF had to first institute a project management methodology with a dedicated project team sent to the US. All of a sudden, much higher standards of technical and aircrew training were required and this meant complex technical manuals, ground training aids and a mission simulator. Over 500 000 spare parts had to be assessed and ordered and base facilities had to be constructed—hangars, depots, engine bays and the like. Then there was the question of operational doctrine, airworthiness and maintenance philosophy, let alone command and control. The RAAF had to make a quantum leap in its thinking.
Controversy

There are generally three issues that arise with the development of a new prototype: cost increases, schedule delays and technical difficulties. All three were to plague the F-111 program before the aircraft were accepted by Australia to the extent that, on at least three occasions, the Government came very close to cancelling the deal.

Even before its birth, the aircraft was controversial. First, there was a major US Congressional hearing into the award of the contract to the General Dynamics company, and while Australia was not involved, the Australian media certainly picked up the ill will against the aircraft that this generated. Then, the British cancelled their F-111 order in January 1968, followed by the US Navy in July, which immediately caused the per-unit cost to go up. The US Navy never wanted an aircraft designed for the US Air Force and so fought against the deal at every opportunity. Next and perhaps more damaging, there were a number of catastrophic failures in some of the D6ac metal components which meant manufacturer, General Dynamics, had to develop a fix. All this would take time so consequently, the scheduled slipped and the Australian F-111s were put into storage for over four years. The media had a field day and the Air Board went into crisis.

Given the state of the Canberras by the late 1960s, the RAAF urgently needed a stopgap measure and so a lease of 24 F-4E Phantoms was agreed—a decision which saved the RAAF from breaking. The F-4 was an ideal lead-in bomber to the F-111 as it was far more advanced than the Canberra, but was not too leading edge to be beyond the RAAF’s ability to manage and maintain. The two-year gap allowed for a much smoother transition to the F-111 in every respect plus it also provided extra time to build the necessary base facilities to accept the F-111 and its supporting equipment.

The Next Challenges

Once the F-111 had arrived, the RAAF had to learn how to use this sophisticated weapons platform. The training regime had been adapted from the USAF and included injections from their Vietnam experience, but it was up to the squadrons to adapt the F-111 to the Australian strategic environment. Operational doctrine had to be developed as well as a through life maintenance program and an airworthiness system that would see the aircraft to life of type.

In terms of maintenance, in the early 1970s, the Air Board decided that the maintenance of the F-111 should be kept entirely in-house. This forced the support system to come to terms with the challenges it faced—training, supply and intimate knowledge of the airframe and avionics. Unforseen was the pressure placed on the F-111 program when commercialisation became government policy in the 1990s—the F-111 fleet again became a political target. However, at least the RAAF’s in-depth knowledge of the weapons system meant it would be a smart customer to the industry proposals.
As well as understanding how to use the aircraft, the complementary challenge was how to keep it. Originally intended to last until the late 1990s, the aircraft would eventually retire in 2010 after 37 years in operational service. Problems with fatigue, fuel leaks and lack of spare parts would all be tackled as the RAAF chose to keep the aircraft up to date. It was in this area that the Defence Science and Technology Organisation (DSTO) came to the fore, and without that organisation, the F-111 cost of ownership would have skyrocketed. DSTO provided many solutions that otherwise would have meant a total reliance on the US for ongoing support.

When it was delivered, the F-111 was what was euphemistically termed ‘an iron bomber’. It could deliver a set of 2000 lb Mk 84 or 500 lb Mk 82 bombs, but little else. An F-111 strike involved very accurate navigation, low-level penetration and overflight of the target—suicidal in modern air warfare. Consequently, over the years, the air staff argued and won the right to acquire enhancements, upgrades and attrition aircraft.

The first enhancement was the reconnaissance pod. Four aircraft were modified to receive a reconnaissance platform in the aircraft’s internal weapons bay. The reconnaissance fit was originally supposed to have been delivered on acquisition, but budget constrains at the time prevented the initial development work. Next, in the early 1980s came the incorporation of Pave Tack, a laser target designation system which brought with it a Harpoon missile capability. Now the F-111 could deliver precision guided munitions and became a world-class maritime strike platform.

But by the late 1980s, and most troubling for the RAAF, was the decreasing reliability and availability of the aircraft’s analogue avionics and spare parts. Industry, both US and Australian, was loath to continue to support such a small contract of obsolete technology. This prompted an Avionics Update Program (AUP) which involved converting most of the avionics and the flight control system to digital. Further precision weapons, upgraded engines and more modern electronic warfare equipment would also follow.

**The Extras**

As well as enhancements and upgrades, the RAAF acquired four replacement F-111As in the early 1980s, which were gradually converted to F-111C status. These aircraft later underwent a Pave Tack and AUP upgrade making them, for all intents and purposes, C-models. The four replacements allowed a better maintenance stagger and higher on-line availability for training and exercises.

Then, in the early 1990s, the Minister for Defence, Senator the Hon. Robert Ray, unilaterally announced that the RAAF would acquire 15 F-111Gs, ex-USAF. As part of the strategic drawdown post the end of the Cold War, the Americans had retired their fleet of FB-111As—a strategic nuclear strike version of the aircraft. These had become surplus to their requirements and consequently negotiations led to the offer to Australia. While the aircraft had undergone an avionics modernisation program of their own, they were not fitted with Pave Tack or other precision weapon
enhancements. They were also delivered without their nuclear weapon delivery capability and relabelled the F-111G. Their addition to the order of battle was problematic for the RAAF as, politically, the Air Force was required to fly them, but in what role? Eventually, it was decided to use them for crew training and conversion courses, which had the advantage of releasing the strike models to the operational squadron and thereby stretch the flying hours. The life of type of the aircraft was extended to 2020 and careful husbanding of the fleet with the G-models deemed this feasible. By 2003, the reality of maintaining an ageing aircraft hit home and the life of type was brought back to 2010.

The Deseal/Reseal Problem

The final controversy to hit the F-111 program emerged during the 1990s decade. This issue became known as the F-111 deseal/reseal disaster resulting from fuel tank maintenance undertaken between 1977 and 2001. Of all the problems the RAAF faced with the F-111, this issue had the most impact, as it forced a change in the RAAF’s culture, and heralded a complete reassessment of how the workforce was treated and managed.

Problems with the F-111 fuel system were to plague the aircraft for its entire life, resulting in one of the most distressing eras for RAAF personnel. The F-111 was able to travel the great distances it could for two reasons—the efficiency of the afterburning turbofan TF-30 engine and the large capacity of the fuel tanks within the aircraft structure. Each tank was an integral component (there were no fuel bladders) and each tank had a polymer barrier of sealant applied on the inside to stop fuel leaks.

The RAAF undertook the first deseal/reseal program at No 3 Aircraft Depot between October 1977 and February 1982. The work was indeed ‘dirty’ and smelly, so much so that a task specific hangar was constructed remote from the remainder of the workforce at the base. Maintenance workers were required to crawl inside the fuel tanks to remove remaining sealant with a ‘water pick’ using water under very high pressure. The hardest task was to hand clean the tanks, scraping any residual sealant which required the use of dental tools. Once clean, a new barrier coating followed by a coating of sealant was applied—a long and uncomfortable, manual process. Re-plumbing the tanks and integrity tests completed the activity.

The effect on individuals varied considerably, with some succumbing almost immediately to exposure to the chemicals involved in the program, while others continued with no apparent affects. Those affected suffered irreparable health problems and many contracted fatal conditions.

By early 2000, Fuselage Fuel Tank Spray Seal Program team members began to show symptoms of chemical exposure. After a medical officer noted a number of fuel tank repair staff had presented with similar symptoms, he reported to the CO of the maintenance squadron who suspended the spray seal program. A full military board of inquiry was then convened.
The finding which hit hardest to the then new Chief, Air Marshal Angus Houston, was the priority the RAAF placed on platforms over its people. The RAAF had developed a ‘can do’ attitude and a culture where performance equalled aircraft on line in the minimum time. This culture had been instilled in all ranks from the earliest times.

For the RAAF, the observation from the entire deseal/reseal program was a realisation that, with the commercialisation programs of the 1990s, the RAAF lost the expertise needed to assist the Maintenance Wing solve the deseal/reseal problem. There was no corporate knowledge or expertise left, and no response team able to assist. Unfortunately, the effects of the deseal/reseal program will remain for a long time. The effects on capability were considerable, and the ongoing health and emotional cost to those involved and their families incalculable. The effects of the deseal/reseal programs will remain for decades and, because of the time scale involved, some cases are yet to present.

**The Transforming Impact of the F-111**

History will show that the F-111 changed the RAAF like no other weapons system to date. The sound decision to conduct all-through maintenance for the fleet in-house allowed the RAAF to modernise its practices and set a higher standard of training for its workforce. The strategic reach of the aircraft meant the RAAF also had to develop its strike doctrine in accordance with emerging government defence policy.

The F-111 arguably drove the RAAF’s maintenance philosophy. This was initially with squadron, intermediate (wing) and depot levels eventually becoming industry based with supporting squadron level (deployable) maintenance. The F-111 arguably forced the emergence of a technical trade restructure and the development of a more complete training system. Also to emerge was an airman career stream within the weapons system. Support from, but not total reliance on, industry (both US and Australian) would also evolve as a consequence.

What else emerged as a consequence of the F-111? Prime among these was an airworthiness system as well as more rigorous air and ground safety programs. Sadly, much of this was prompted by fatal accidents and the considerations of the various boards of inquiry.

Finally, the RAAF came to realise it had to adapt to new command and control arrangements. The old system of the Base Commander (a senior air commodore) at each base being ‘king of all he surveyed’ was no longer sufficient. The move to the Force Element Group or FEG structure was prompted from operations of the strike and reconnaissance force.
Conclusion

In this paper, I have argued that the F-111 forced the RAAF to modernise—its training, doctrine, employment strategy, facilities, command and control, and personnel practices. The wise decision made before the aircraft were delivered to conduct all-RAAF maintenance meant the RAAF had to upskill its workforce and develop a through life maintenance philosophy. The RAAF consequently became a knowledgeable customer after commercialisation of the 1990s and was well placed to contribute to the air campaign if and when required.

The second significant legacy of the F-111 was that the RAAF was better able to smoothly transition the F/A-18, C-130J, and AP-3C into service. Without the skills and knowledge developed in its personnel, and a sound understanding of airworthiness principles, the challenge would have been all the more difficult. Such a stepping-stone approach to transition augurs well for the eventual transition to the Joint Strike Fighter.

The RAAF kept the F-111 aircraft relevant to the changing strategic circumstances, thus maintaining a credible deterrence. No other air platform has featured in every Defence policy document, White Paper and Strategic Review for as long a period. No other ADF strike platform has taken up so much time in parliamentary debates and no other capability has generated such polarised views of its utility.

To conclude, in the F-111 fleet, the RAAF had a highly capable strike force able to meet all government expectations and, if required, deliver offensive policy outcomes. Consequently, and to echo Air Marshal Sir Donald Hardman’s words of 1954: ‘An air force without bombers isn’t an air force!’
Panel Discussion

Mr David Gardner
Dr Alan Stephens
Air Commodore Mark Lax

Group Captain Arthur Skimin (Retd) (RAAF Association): We heard David Gardner mention his collection and acquisition of the F-111. We heard Mark Lax go into the costs of the F-111. We heard Alan Stephens mention the RAAF being a hollow square at one point in time, but David you’re talking about acquisition and infrastructure development of an increasing collection of aircraft memorabilia. The costs of that over time will increase substantially, a little bit like the cost that the other two speakers spoke about. Is that function and role, despite the decisions in 1988 to put it on the ORBAT [Order of Battle] and develop the collection under the RAAF, a real function and role and cost for the Royal Australian Air Force or would that collection be better moved into the national aviation and space collection that is still in the melting pot?

Mr Gardener: There was a plan to build a National Air and Space Museum at Point Cook in 1993. It went till 1996 and the State Government pulled the pin on it and there was no money, so we picked up the pieces from then on and we built the Museum to what it is now. We are looking at a new building and talking to Carolyn Spittle [ASRP-AF] yesterday about funding and things like that, quite informally, we may have to start looking at sponsorship in the future. But it is part of the Air Force to look after its heritage—nobody else is going to do it; I’m not talking about the Army and Navy—but when it comes to the infrastructure side we really don’t have control over our infrastructure, do we? We’ve got DSG [Defence Support Group] doing that for us, so we’ve got to go cap in hand and beg for it. I have to say we’re very good beggars in the Museum but, when it comes to getting dollars, we’re not all that crash hot. As I said initially, there was a plan to have a National Air and Space Museum and to absorb the RAAF Museum into it, but that’s fallen over simply because of the cost. There are other organisations around Australia that call themselves ‘National Aviation Museums’, but they really don’t have any funding; they go cap in hand to the Government to get a free aeroplane each time they go out of service and 15 years later we’re going to pick up the pieces. Fortunately, we’ve got a system in place now where that won’t happen, but I think we’ll just have to see what time will tell about how we get our funding in the future.

Warrant Officer Ian Kuring (Australian Army History Unit): I’d like to say a couple of things to support Dave. It would appear that Dave and I have both been involved in military history and museums for around about the same length of time but in different Services, and we both have careers that were involved in real things in our
Services before we became involved in museums and military history. First thing is the Australian War Memorial only looks after what happens with Australians in wartime. It does not cover what happens in the military in the periods in between, and we are not good at preserving our history of what happens in peacetime and also what happens in Australia while there is a war on and how we prepare and organise and train our force to go to war. And I think that’s important and it’s something that is not obvious but, when you become involved in military history as Dave and I are, it is something that our museums are able to cover. The other thing is that, for all of us who’ve served and are serving, what we do today is tomorrow’s history and we have to remember that, and that is not obvious to us. Even when I was running the Infantry Museum at Singleton, you’d have guys who’d come in and say, ‘Who really cares about history?’ Then I’d remind them, ‘In 10 or 15 years’ time, you’re going to bring your son in here and you’re going to want him to see what happened in Vietnam or Somalia or Iraq or Afghanistan and if you haven’t got the stuff there, then you can’t show it to him’. And this is why we all have a responsibility for preserving our own history and we need to do it as it’s happening. Dave, I don’t know whether you’ve got anything to add to that.

Mr Gardener: The Army’s sticking up for us—there’s a problem there!

Squadron Leader Roy Philpott (RAAF – 11 Squadron): Cognisant of the fact that Air Vice-Marshal Oxley is going to give us a brief on JSF [Joint Strike Fighter] and what not, about a month ago Air Marshal Brown spoke to us in Edinburgh about JSF and the numbers that we are getting. The question’s been asked, are we getting too many? Air Marshal Brown, you said we could probably use more, given some of the strategic assets for bringing on line—Wedgetail and the tankers. I know this is pre-empting the future lectures, but I guess my question to the panel right now is do you think we’re finding that right balance of a deterrence to keep Australia guarded and are the platform numbers sufficient?

Dr Stephens: I’d like to answer that if I could and I would set it in the context of the observations I made about the effect of the Vietnam War on Australian military strategy. In about a year’s time the RAAF, in my opinion, is going to be the best it’s ever been, with due consideration for the era in which a force exists in its history. I’d like to acknowledge in saying that what I think is one of the largely untold stories of the last 30 years of the vision, persistence and indeed courage, operating within a somewhat mendacious environment, of a small number of Defence people, mostly Air Force but also DSTO, Defence industry etc., that have seen through the hard work needed to put this force structure almost in place. And I’m referring particularly to things like AEW&C and tankers for which we battled for decades before they were finally approved. As I say, that whole system will come together very soon. In relation to your comment about numbers, what I see is that, because of this exceptional effort over the decades, the numbers are less important than the whole system and, in my opinion, we’ll have a system capable of not just reacting, as we have for so long, but of
actually shaping and deterring, taking the lead in our part of the world. What we need to accompany the force structure is political and public awareness of what precisely this system can do, rather than our obsession with unwinnable futile wars of choice in remote parts of the world. So with the numbers, you're just playing on the margins there. What's important is this quite superb strategic system. What's essential now is somehow to raise the political and public awareness of it.

Squadron Leader Steve Wright (RAAF): I have an interest in Point Cook history in particular. My question is for Air Commodore Lax. I was very pleased to see your photos of the F-111 and the 'dump and burn' and, if I could just link it with some others, it reminds me that maybe it was a very good aircraft for air shows. I just wonder, in your opinion, if we had sent the F-111 into war—I know it went there in photo reconnaissance roles but we didn't actually send it there in any other role—do you think that the Air Force would be a different place today if we had put the F-111 into war with some real teeth and gained some experiences from that?

Air Commodore Lax: We tried very hard to send it and, again, political will intervened. Gulf War I was a case in point. Bob Hawke, Prime Minister at the time, said, 'I don't want sand on Australian boots.' Consequently, we sent a naval detachment and a medical team and a few of our Special Forces chaps to do Special Forces things. Would it have changed the Air Force? Would it have influenced our thinking? No, I think it would have confirmed our belief that we were on the right track. Certainly, under Air Marshal Funnell's guidance, we got our doctrine in order. A lot had been thought about of how we were going to use these aircraft. In fact, I argue that the F-111 actually forced those that wrote strategy and policy to think differently; it changed their ideas about how to use it. It was a deterrent; I have no doubt about that. If we'd sent it to the Gulf or to other parts of the world in various other guises, would it have made a difference? No, I think it would have confirmed our belief that we were doing the right thing—continually keeping it relevant by updating it, particularly weapons and systems, and adapting to the modern way of war. We watched very carefully how Gulf War I was run and it fitted pretty well the way we were going. In fact, statistics coming out of that and the Libya raid in 1986 convinced us that we had made the right choice in terms of how we were arming it and how we would operate it.
The New Drive for Modernisation

Air Marshal Errol McCormack (Retd)

Sir Neville McNamara, Chief of Air Force, ladies and gentlemen, good afternoon. It would be remiss of me if I did not take advantage of a captive audience to do some recruiting for the Williams Foundation. We have got a bunch of ‘old fogies’ who are running the Williams Foundation at the moment and I am recruiting to get some younger people, younger minds on the job. So if you would like to become involved in the wider defence debate outside the confines of the Department of Defence and, shall I say, the politically correct confines of the Department of Defence, please log onto http://williamsfoundation.org.au, pay your nominal fee and we will welcome you on board.

I would like to make the point that I have been closely involved in the Air Force over the period that I will be talking about. So I am not an historian as such; I am a participant and, as such, I will give you my perspective on the way things went on and happened, and if I offend anybody I will apologise in advance. I have already heard some statements from our previous speakers with which I probably disagree but we can talk about that later.

When I first got the invitation to speak, I thought I would cover it under ‘People’, ‘Process’ and ‘Equipment’, because I think that covers really what the whole game is all about. And I will concentrate on the 1990 to 2010 period, although I may stray a bit sideways at times. Now it would be impossible to cover 20 years of the RAAF’s history in 30 minutes, especially if I tried to cover all the operations. So I will not delve into those, but I will give you some of what I think are highlights in the broader scheme of things.

Now the topic, ‘The New Drive for Modernisation’, I was not sure that it was a correct representation of the events of the last 20 years. I think air forces, by their very nature, are always striving for modernisation, so ‘new’ may not apply. I think what happens is that the budgets go up and down, and we keep striving, but sometimes we cannot meet our expectations. Let me give you an example of ‘new’. When I was posted from No 3 Squadron to No 1 Bomber Operational Conversion Unit back in 1966, which a lot of people here would not remember, the first amendment list I had to incorporate in the Canberra Flight Manual went something like: ‘Page 1, Para 1 – In the sentence “the Canberra is a high-speed, high-altitude bomber”, cross out the words “high-speed”’. However, I could not think of a better topic to be talking about so there it is, ‘The New Drive for Modernisation’.
Overview
It goes without saying that modernisation means change and you do not get significant change in a large, conservative, bureaucratic organisation like Defence unless you have a ‘change manager’. I have somewhat cynically made this statement in the past. It is another way of saying that no significant and lasting change can occur without the change manager enlisting a large and dedicated following, a team that believes in the proposed changes from within the organisation. I have seen too many bright ideas forced upon an organisation that disappear as soon as the change manager disappears; it could be referred to as the ‘consultant effect’. We have had a few of those in the Air Force.

People
Now, let us talk about people. As Dr Stephens stated this afternoon, the RAAF built up to around 24,000 for operations in Vietnam. It stayed that way until about 1991. So, what kept the numbers up so high after the Vietnam withdrawal? We have heard a bit of this earlier. In developing plans for acceptance of the F-111, the RAAF had decided to conduct all possible maintenance on the fleet in-house. This led to very large, very capable, often underutilised, depots and maintenance squadrons. It should be noted that some of the depots were hotbeds of non-Service activities; in other words, ‘foreigners’—I have got personal records of those by the way. While engineering capability was developed to a very high level, the Air Force lost operational capability when, to meet budget constraints, No 76 Squadron (Mirages) was disbanded. Then in the late 1980s the Defence Budget was low and not expected to improve, and it became obvious that the squeeze was coming and that the RAAF would have difficulty justifying the numbers. There followed a series of internal and externally-imposed reviews that resulted in a cut of over 20 per cent in six years. During this period, Defence started the Commercial Support Program, where elements of the Services were tested against commercial company bids. I must say that some of the changes within Air Force were at least questionable. The disestablishment of an armourer mustering in a fighting force is an example—not a good move—I understand they are back in again now. We thought those cuts were bad but worse was to come.

Minister for Defence, Ian McLachlan, commissioned Dr Malcolm McIntosh to conduct an efficiency review of Defence, the Defence Reform Program (DRP). As a result, the RAAF took another reduction of over 20 per cent on top of the previous reductions. Because of its F-111 maintenance policy, the RAAF took the largest personnel hit with the Commercial Support Program. However, do not put all the blame on Malcolm McIntosh; he was advised by some senior Defence (including RAAF) ‘experts’, and you know what the definition of an ‘expert’ is. To give some idea of the misconceptions floating around at the time, the CDF of the day advised me that the RAAF could not justify more than 4500 people in uniform—if you did not fly an aircraft, you did not need to be in uniform! The other amazing thought for a supposedly expeditionary force was local purchasing. There was no need for common stores because buckets, mops
etc. could be purchased locally. Thank goodness for Timor. Surprise, surprise, there was no Bunnings in Dili! Additionally, in the middle of the drawdown, understaffed Service units had to set up and run the logistics chain from Australia to Timor, as civilians could not react in time to activate the necessary base services.

Harking back to my comments about change management, the DRP directed that there were to be a maximum of 100 in each Defence and Service headquarters and all were to reside, I repeat, all were to reside in R1. Things have changed a little bit and I think that one was soon forgotten. As I said, in many ways Timor saved the day. The Chiefs of Staff Committee started planning for the Timor intervention in January 1999 and it was obvious then that the cuts were gutting the Services. The DRP deleted many of the sinews that held the Services together. For example, technical support, including airworthiness, was gutted on the premise that central libraries, not technical libraries, would keep publications up to date. However, like most changes there was some good. A few ‘sheltered workshops’, such as SAFOT (Senior Air Force Officer, Tasmania) where they had three lieutenant colonel equivalents, were cut back. Come to think of it, parts of Defence could probably do with another DRP-style clean-out right now.

The last 10 years have seen a low re-establishment of services essential to the conduct of operations. Additionally, one can see why CAF uses the term the ‘RAAF team’ to include public servants and civilians; they are essential to fill the gaps in support for operations. However, a peacetime Air Force, and I stress that because it has been kept at peacetime rates, a peacetime Air Force of between 13 and 14 000 that has been on continuous operations of some sort or other since mid-1999 is bound to be suffering from deployment fatigue and I hark back to CAF’s comment this morning about the air traffic control graduation.

Before I leave ‘People’ I would like to cover pilot training. Prior to 1975, the RAAF had a reasonably large operational pilot base. Since then, Nos 2 and 76 Squadrons and No 1 Bomber Operational Conversion Unit were disestablished and the helicopter force transferred to Army. The RAAF was left with a much smaller operational pilot base. Additionally, the six-year short service commission for pilots was abandoned in favour of a ten-year return of service obligation (ROSO), and for some time ADFA was the preferred avenue of entry for aircrew. The shortage of fast jet pilots resulted in very few being available for training organisations. This also exacerbated the problem. The many plans to solve the fast jet pilot shortages usually involved throwing more people at the lead-in fighter training organisation. These plans were generally not acceptable. The combination of a smaller base, lower pilot training throughput, ten-year ROSO, ADFA entry and additional candidates in the fast jet training system appear to have actually exacerbated the problems. I understand Air Force has a good plan coming at the moment.

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1 Bunnings is a chain of hardware stores in Australia and New Zealand.

2 Building R1 is one of the two major buildings in the Department of Defence, Russell Offices complex in Canberra.
I would like to quote Paddy Gourley, a very senior public servant retired, on his overview of the Black Review—"It's a fair bet that the dozens of reviews of the whole or parts of the Australian Defence organisation over the last 40 years have made things worse for it." I cannot agree more with Paddy's overall assessment. Paddy also suggests that the Tange Review of 1973 should be the model for any future reviews. I disagree with Paddy on that because the Tange Review entrenched bureaucratic public service control, as opposed to ministerial control of the military, produced the flawed command structure and failed to develop a strategic joint staff to provide joint advice to the Minister on strategic military issues.

Organisation

Now if somebody has better figures than I have, I will not 'die in a ditch' over the numbers shown in this next slide of three-star and four-star appointments in Defence, but they are orders of magnitude correct and, in fact, I have not included the three three-star equivalents that are in the Defence Science and Technology Organisation (DSTO).

I believe it would not be an overstatement to say that the Services have had to work within an increasingly dysfunctional bureaucratic system in Canberra for at least the last 10 years. To quote Mark Thomson with reference to the Rizzo Report in The Weekend Australian last weekend: 'One has to ask why an organisation with so many highly paid executives got so many basic things wrong.' Mark Thomson had three reasons for the problem (as shown in the slide). I cannot find fault with his points. I would suggest, however, that at least one review that did achieve the aim of more efficient administration and also resulted in a reduction in the number of senior officers

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3 The Black Review, Review of the Defence Accountability Framework, conducted by Professor Rufus Black was the first comprehensive review to examine personal and institutional accountability in Defence as a whole.

4 Paddy Gourley, 'Defence's damaging addiction to reviews ... and ', in The Public Sector Informant, September 2011. The Public Sector Informant is a monthly lift-out section published in The Canberra Times.

5 The Tange Review was conducted in 1973 by the then Secretary of the Department of Defence, Sir Arthur Tange, and resulted in the five then-existing departments (Defence, Navy, Army, Air and Supply) being amalgamated into one, established the position which is now CDF, and created the diarchy of CDF and the Secretary.

6 In February 2011, the Government appointed an independent team of experts to develop a plan to address significant problems in the repair, maintenance and sustainment of the RAN's amphibious fleet. The team, led by Mr Paul J. Rizzo, submitted its report, Plan to Reform Support Ship Repair and Management Practices, in July 2011.

in the Department was the Sanderson Review into the higher Defence organisation.\textsuperscript{8} The Sanderson Review was a catalyst for significant major equipment approvals and provided the genesis of many RAAF projects. I believe that model is valid today.

I would now like to talk about the RAAF itself. To do that, I need to go back to 1986. The RAAF had adopted the principle that the Officer Commanding (OC) a base virtually owned everything he surveyed. This structure resulted in OC Amberley, for example, being in command of two helicopter squadrons (Chinook and Iroquois) and three bomber squadrons (two F-111 and one Canberra). Additionally, at sometime in the past, the RAAF had disestablished wings and the five squadron COs worked directly for the OC. There was a senior staff officer in Base Headquarters, who was not in the chain of command. One can imagine the difficulties of standardisation and safety in the widely-based helicopter fleet. Introduction of the P-3 and F-111 resulted in the RAAF becoming more professional in operations but, in the case of the F-111, the RAAF had learned some lessons in logistics from the USAF that were not so good; centralised maintenance for example. It was a case of apparent savings in manpower at the expense of productivity. In 1986, the CDF of the day asked the three Service Chiefs if their Services were organised in the way they needed to be for operations. Air Force Office, I believe, was about to say yes, but decided to bring Operational Command into the discussion. At about the same time, Terry Wilson, CO 12 Squadron, had submitted a paper to OC Amberley, Ian Westmore, stating that the RAAF was not organised correctly for operations. The OC passed the paper up to Command with strong supporting recommendations. So in February 1987, the first groups were formed and the wings re-established. Strike Reconnaissance Group, Tactical Fighter Group, Maritime Patrol Group, Air Lift Group and Tactical Transport Group, along with Nos 81, 82, 84, 86 and 92 Wings were formed. As an aside and harking back to my change management, Amberley actually changed organisation in October 1986 because Westmore, being Westmore, was leaving at Christmas and he wanted to have it all in before he left so you could not change it back. This reorganisation resulted in a significant improvement in operational orientation, standardisation and safety for the operational force. Unfortunately, and there is always an ‘unfortunately’ I am afraid, at the same time in the quest for manpower savings base squadrons were divided up into specialist support squadrons. The operational squadrons gave up their administrative support and were to be supported by an administrative squadron. You guessed it, the administrative squadron was exceptionally well served with administration and the operational squadrons missed out. This chimera of savings in manpower resulting in a loss of productivity was repeated with the DRP and shared services 10 years later. Another problem with the first stage of this reorganisation was the existence of a number of one-wing groups. This anomaly has since been fixed with the amalgamation of groups—Air Combat Group, for example.

ACMAT-AF (Assistant Chief of the Air Staff – Materiel), who was responsible to both the Chief of the Air Staff and the Deputy Secretary Acquisition and Logistics, and RAAF Support Command were split and absorbed into what became the Defence Materiel Organisation (DMO) and Logistics Command. I really do not feel qualified to comment on those events more than what I have already said about the Department. Additionally, DMO has not been a stable organisation for long enough for any reasonable assessment to be made, and I do not see this state of affairs changing in the near future.

**Equipment**

Let me turn now to equipment. As I stated previously, even with the tight budget situation, 1990 was an auspicious year for Air Force re-equipment programs, and I hark back on the Sanderson Review. It resulted in a joint Development Division with joint, land, air, sea and resources elements. Development Division was able to bring a joint capability solution to discussions with Force Development and Analysis (FDA) Division—otherwise known as the ‘Forces of Death [or Darkness] and Annihilation’—which had often worked on a ‘divide and conquer’ approach to single Service proposals. It allowed arguments on the Major Equipment Program to be sorted out at the 06 level (colonel equivalent) where, unlike two-stars, most participants were closely aligned with the capability. It also ensured that the jointly agreed Major Equipment Program fitted within the funding allocation. These abilities were not available to the single Service organisations.

Why was the Sanderson solution changed? That is a good question. Why do I harp on the Sanderson solution? It is one of the few reviews that resulted in fewer ‘stars’ and pushed decision-making down the chain; a most unusual event in Defence these days. As an aside, with the amalgamation of the single Service capability development sections, Navy refused to allow the helicopters for the offshore patrol vessel project—the ship that the Navy did not want—to come across to Force Development (Air) and there you have the start of the Seasprite debacle. Now, I am not here to expose the Seasprite but that is where it all started, from a stupid decision.

You have probably seen this next slide earlier today; I ‘stole’ it from the Chief. Nearly all the lines on the slide were endorsed into the program in the early 1990s—at least half. That period saw the successful endorsement of AEW&C, MRTT (Multi-Role Tanker Transport), C-130J, Lead-in Fighter and Air Defence System. I would remind you that was in the early 1990s but, as the Chief said earlier today, Vigilare (the air defence command and control system) which was approved by Government in 1991 has only just entered service and the AEW&C is close to being operational. At the other end of the scale of time into service, we have seen some magnificent work done in bringing the Heron, C-17 and Super Hornet into service, on time and on budget. One could legitimately ask why the time from endorsement to in service reduced so much between Wedgetail and Vigilare, and C-17 and F/A-18 Super Hornet. I believe
off-the-shelf would be an appropriate comment. Underspent budgets could also have been a factor.

It is interesting to note that the Development Division of 1990 would not have been able to obtain endorsement of an E-2 or E-3 type AEW&C aircraft. DSTO and Force Development and Analysis Division endorsement was dependent on the use of an electronically scanned radar system. How about this for a hypothetical? What if in 1990 the decision had been made to buy an E-2 system? It would have been acquired in a couple of years; in fact, the US Navy was very keen to sell them to us. The RAAF would have had 19 years of experience with AEW&C and be looking at acquiring Wedgetail after the non-recurring costs had all been paid for by Turkey and Korea—an interesting what-if?

Summary

The last 20 years have been very turbulent for the RAAF. Over the first 10 years of the period, the organisation had to absorb a 45 per cent reduction in the size of the uniformed force without any reduction in operational responsibilities. Then in the last 12 years the RAAF has almost continuously been on active duty in many areas. Additionally, the RAAF has accepted and is accepting into service a very wide range of new capabilities. Well you might ask, if the Department is as dysfunctional as I have intimated, how did the RAAF achieve so much with so little? The answer of course is, with outcome-oriented well-trained people in an operational organisation doing extraordinary things.
Necessity Driving the JSF Concept
How Will JSF Cause the RAAF to Evolve

Air Vice-Marshal Kym Osley

Chief of Air Force, Air Marshals, ladies and gentlemen, I really do appreciate the Chief allowing me to talk about the F-35. I obviously thought I was walking into the wrong hall, going to a RAAF History Conference and talking about our future fighter aircraft but I do thank CAF for allowing me to talk about it. I imagine it is because we have been thinking and talking about the Joint Strike Fighter (JSF) for so long that it has actually got a history of its own that is now on the record. I have been Program Manager of the New Air Combat Capability since late last year and I certainly am very much enjoying the challenges. I must admit I am never short of getting advice. I get advice from ‘across the pond’ and I get advice from ‘Russell’ all the time. Every morning I wake up at six o’clock and I get onto my BlackBerry and I surf around the world to find the latest stories about the JSF and I wait with trepidation, and most mornings I end up in communication with the Minister’s Office. So it is a great way to start the day and if anyone would like to join me, please line up!

I took over from Air Marshal John Harvey and I remember the comment he made the first time I met him after I got back to Australia from the US. It went something like this: ‘The project was running fine when I was there; I’m not sure what’s happened since.’ So those were the words that welcomed me to the job and I must admit it has been great fun ever since then. There is a whole bunch of things I could talk about with the JSF today but I actually will not be necessarily touching on all of those. I think we had a question about why 100 aeroplanes but I will not go into that in too much detail. What I want to really talk about today is how the JSF will affect the Royal Australian Air Force. When you think about it, the JSF is going to be in service when we get to our centenary and it will be an interesting place to be. To start, I thought I might just make sure that everyone understands how significant the JSF is as a program—I am sure you are if you read the media. Just to put it in context, if we took the Snowy Mountains Scheme and then added on the costs of inflation etc., we would be up to about 10 billion in today’s dollars. So, obviously, a fleet of JSF is just a little bit more than the Snowy Mountains Scheme. If we took the Sydney Harbour Bridge, it is about one and a half billion dollars today; so around 10 Sydney Harbour Bridges is about the cost of the fleet. Now, that is not meant to indicate to you that this thing is exorbitantly expensive. What it is meant to indicate to you is that this is not just an Air Force program, this is not just an ADF program; this is actually a major program for the nation of Australia.

However, to put it in context from another viewpoint, we are only three per cent of the total JSF program and so if we go to the US and have a look at what the US is spending, they are going to spend the equivalent of our annual gross domestic
product (GDP)—admittedly, spread over many years—on the F-35 program, so it is an enormous international program. There are about 3500 companies around the partner nations of the JSF that are, in fact, building parts for the JSF. In those companies, they are building around about 30 000 parts; being sourced worldwide and coming together in Fort Worth. They are being managed and put together by about 40 000 people and, ultimately, they are going to make around about 3000 Joint Strike Fighters. I will not put a bet on the total number of aeroplanes that will be made, but I will say that it will be a very, very large number in comparison to recent fighter programs.

I will take just a couple of minutes to talk about the program and just how it is going. Mark Lax raised a few issues to do with costs—I particularly liked his cartoons. However, I would like to put a couple of misconceptions straight. What you have seen in the media over the past 12 to 18 months is, in fact, a fundamental review going on within the program. It is true that at the end of 2009 the program was in a rather poor state. It was not going to make its schedule and it was, in fact, over cost. They have been through a fairly major review over this past 12 months; it is called a ‘Technical Baseline Review’ and then an ‘Integrated Baseline Review’ to implement the changes. The name is not important. What is important is that they do now have a realistic schedule and it has been verified a number of times. They have put in a very conservative Program Manager who was actually heading to retirement, so he had no real reason not to seek a realistic schedule, and that person has managed to drive the JSF Program Office to that realistic schedule. So, at this point in time we have a clear path to make Initial Operational Capability (IOC) in Australia of 2018, which is what we were approved to do at the end of 2009.

Mark Lax raised the good point, and so did the cartoon, of the cost of the JSF. I know that there will be some cynics in the room that will say, ‘Well, of course the cost has been going up.’ It is a bit counterintuitive but the cost of the JSF is actually going down. The reason for that is because at the start of the program they put together the partner nations and they all contributed to the amount of development money that would be required. About 43 billion dollars was required. Our three per cent share ended up being around about 200 million dollars and that was a fixed price for Australia. So, when we put our 200 million down that was, in fact, a fixed price contract. Any increases in cost for development would have to be borne by the US. Since then, there have been two cost increases that total 7.4 billion. Australia has not contributed a cent to that; the US has paid the 7.4 billion. What that means though is that, when we get to production, you are not having that ‘death spiral’. If aeroplanes are not produced, you are not going to have the non-recurrings spread between a diminishing fleet. So it is a good outcome to have that. The other reason the price is going down is that it is the normal way that air combat aircraft production develops. You start off with a very high price for the first couple of aeroplanes as you sort out production and then the cost goes down—a thing called a ‘learning curve’. We are, in fact, well down the ‘learning curve’. We are actually now just going to contract for the fifth year of production. For the first year of production, yes, the costs were high. They were in fact over 200 million. The next year that dropped to around about 150 million and the costs are
coming down at quite an incredible rate. And, of course, we are not buying until we get to the sixth year of production, so the costs will be well down by that point. As well as that, they have an anticipated cost for the JSF. They have worked out budgets for each year, they have tabled those with Congress and they have been well reported by the media. What is not reported is that the fixed price contract for the current year of production—this year—has, in fact, been settled around about 10 per cent below the cost estimate. So, not only are the costs coming down, but actually the fixed price contracts they are negotiating are coming in under that. So I will say that at this point in time we have adequate funding from what we were given back in 2009 to buy our first 14 aircraft.

A few other issues that I would like to talk about are some of the other things that have been occurring recently. Flight test of the aircraft remains well ahead of schedule. It is very reassuring for an aviator to go to Edwards Air Force base to talk to the military test pilots there and for them to say that it ‘flies like an F-18 on steroids’ and things are going well. The mission systems are going well through test and they are, in fact, ahead on test points and flights for the aircraft. That is always a good sign. Production is also only slightly behind schedule. Over a year, they have lost about six and a half days; so a little bit different, perhaps, to what has been reported in the media. The latest breaking news is, of course, that we now have production USAF Joint Strike Fighters going to Eglin Air Force Base, where they are going to commence training at the end of this year and into early next year. So next year we should have our first USAF F-35 pilots that have gone through that training program.

I am not saying there are no challenges and I am sure some of you have heard me in other forums where I do outline all of those challenges. It is going to be a long road and I expect many, many times I will be waiting outside the Minister’s Office with a telephone book down the back of my pants waiting for a conversation or ‘tea and sticky buns’ without the sticky buns. I am sure that will happen and I am sure there will be days when I will be willing to swap my job, but I think the end result will be worth it. What I am seeing is some good work over the last year and that we are on a good path for a 2018 IOC.

For those that are not aware, we are looking at getting our first two aeroplanes in 2014—I have arrived at exactly the right time. I have already signed a very large cheque for the parts of the first two aeroplanes. I am going to sign an even larger cheque for the first two aeroplanes next year and then they will commence going down the production line. So, from next year, we will have an Aussie roundel on a JSF tail cruising down a production line. I have already been through the selection of the initial aircrew that are going to go onto those courses and, in fact, we have also got a short list of F-35 COs lined up as well. So we are talking about workforce, we are talking about training, and we are talking about entering into the procurement of the aeroplanes in the not too distant future. This is not a hypothetical discussion any more.

We are going to put those first aeroplanes into a training centre at Luke Air Force Base in the US. So the two aeroplanes will go in and they will give us credits at the
integrated training centre and we will then train our pilots over the coming years and build up a pool of about 25 pilots. They will then assist us in doing operational test in Australia when our first four aeroplanes turn up in 2017 and then help to stand up our first JSF squadron in 2018; these will be exciting times.

Now Australia has always sought a capability edge in air combat and we have achieved that over the years. Today, I think you have had a bit of a romp through some of the aircraft types involved and some of the decisions that were made in the past about how to keep that edge. You are well aware that in 2007 the Government made a decision to buy the 24 Super Hornets. The 24 Super Hornets are, in fact, a bridging capability and the Minister acknowledged very openly that, ultimately, we will be going to an all-JSF fleet and that the F/A-18Fs are still just a bridging capability. Next year I will go to Government to seek funding for the next tranche of F-35s and I am expecting that we will be asking for up to 58 F-35s next year to allow our IOC of 2018, and then to finally get three squadrons of JSF by 2021 to replace the F/A-18A/B fleet. The point I would like to make is that the JSF, as a 5th-generation aircraft, is what we need for the 2020s and onwards. If you look at the regional systems, the integrated air defence systems, and if you look at the 4th and 5th-generation fighters coming into the region, if we do not have a capable 5th-generation fighter fleet by the early 2020s we are going to be in serious lag when it comes to capability.

I will just do a little bit of F-35 basics here with this next slide:
For those of you who are not that familiar with the program, the aeroplane that we are buying is the one at the top right of the slide, which is the conventional take-off and landing (CTOL) version that is being procured by the United States Air Force and also by most partner nations. The one on the left is the United States Navy carrier variant and it is also being procured by the United Kingdom. At the bottom of the slide is the US Marine Corps short take-off and vertical landing (STOVL) version, also being procured by the Italian Navy. The simplest way to think about them is the one on the top left has big wings and a hook—the hook is for obvious reasons, the big wings gives it a slower roll rate but extended range. The lower one has a big fan that takes away fuel capacity, so it has a shorter range and a smaller weapons bay but it can go vertically. The CTOL version (top right) is basically your crisp roll rate, reasonable range and reasonable compromise, and that is the one we are going for. The main reason we are going for this one is because the United States Air Force is buying 1700 of them, and they are also the lowest cost and the best for interoperability. The US Navy will end up buying a few hundred of the carrier variant and the US Marines will also buy a few hundred of the STOVL version.

I would just like to point out the transition that we are going to go through over the next few years and you can see that on this next slide:

We have already started it and we will be in the transition for 15 years or so. I missed the Chief’s presentation this morning but I am sure, judging by the slide that Errol
McCormack put up, that it is a period of transition all up, and for the Air Combat Force it is a long transition and a complex Rubik’s cube. We cannot get more people—there are no extra people—so we must do it within our cap, but we must transition without dropping capability. The Minister has drummed into me many, many times that we must have four squadrons of combat aircraft throughout that transition and that is the challenge; doing it with no more resources, having the four squadrons and yet bringing squadrons down and standing them up. So it will be a challenge over the next few years. But you can see on the slide that, ultimately, we will go to three JSF squadrons and one Super Hornet squadron, and then finally, when the Government decides to retire the F/A-18F, we will go to four JSF Squadrons.

I mentioned that the JSF is not an Air Force or ADF program, it is an Australian program. One thing that the JSF is doing, which is different to what has been done in the past, is the way that it has engaged Australian industry and involved Australian industry. In the past, we have had Australian industry programs. If I take the F/A-18 industry program for example; typically, they have made parts for our F/A-18s, they have put our F/A-18s together, they have tested our F/A-18s and then they have shut their doors as our F/A-18s have gone into service. With the JSF, however, we are competing on a global supply chain. We have some strategic opportunities. They give us around about three per cent of the industry opportunities, strategically, and they are really ours to lose, as long as we meet the cost and the schedule. Those companies that are listed on the next slide have won their opportunities fair and square, internationally. They have managed to get the accreditation, they have met the security requirements, and they have competed against industries in other nations and come through and won them. So this is good for Australian industry. However, there are challenges and the Australian dollar being high is a bad one, and the program being delayed is also a bad one. But, all in all, Australian industry has done a commendable job there at winning business.

I would now like to move on to how I think the JSF will change the face of the RAAF, and I think it will be of a similar magnitude to the F-111. I would just like to cover off on a few areas and I will pick intelligence, workforce, networking, logistics and training, just to give you a bit of a feel for it.

I think all of you are aware that at the heart of the F-35 and, in fact, at the heart of all 5th-generation fighters is software and their mission capabilities. We judged previous generation aircraft by weapons and aerodynamic performance. The JSF and other 5th-generation aircraft we are judging by software, sensors and signature. The JSF will have an insatiable appetite for information. In the case of the JSF, we call that mission data, and it will have an incredible mission data load full of different parameters. This next slide depicts a comparison between a 4th-generation fighter if you look at the aqua column (say an F-18), versus the F-22 in the blue column (an early 5th-generation aircraft), versus the F-35 in the yellow column. What this gives you is an indication of the number of parameters that you can put into the system to assist you in identifying a target coming towards you. If you take the F-18, you will have a half a dozen or so
parameters and then it will give you an indication of what it thinks the target is. The F-22 has 250 and then the F-35 has 650 parameters. I am joking to a certain extent but the F-18 will tell you something is there, the F-22 will tell you it is a certain enemy aircraft type and the F-35 will give you the phone number of the dentist of the pilot flying that aircraft. So we are talking about a lot of information being in that aeroplane.

Of course, feeding the JSF will be our problem and here I will be a bit critical of the way that we are structured at the moment in intelligence. We need to change that. What we need are common databases between our allies and partners, and I know that lots of people are working on making that happen. We need our intelligence agencies—Defence Imagery and Geospatial Organisation (DIGO), Defence Signals Directorate (DSD) and Defence Intelligence Organisation (DIO)—to also have a common database, an all-source intelligence base that we can then access; not just for the JSF, but for the JSF, the air warfare destroyer, the AEW&C and every weapons system that comes after it. This is just the leading edge, not the exception. We also need to develop experts in the ADF that can manage this. It is a different job to an imagery analyst. It is a different job to an intelligence officer (INTELLO) and we need to work our way through it. We have called them ‘Operations Specialists’, but we have not yet defined what their work will actually entail. However, it will be an incredibly demanding exercise to feed the JSF. In return, though, it will give you a lot of information. We are sending out something that has electro-optical sensors, it has radar sensors and it has various ways of collecting information. When the pilot comes back, he will have, in fact, around about 300 gigabytes of information just in his little data transfer module that he brings back into the squadron. So you are talking about an incredible amount of information coming back that will need to be managed.

I’d like to talk a little bit about the workforce and what has changed. I think some of the people in the front row here can remember some of the trades shown in this next slide—I was going to say carpenters but that would be a bit unkind; signallers. maybe? I did not put navigators up there; I probably should have but that would go against the grain.

Obviously, these and other trades were very important in their time but they have now disappeared. They have disappeared because other ones have come up and I think Errol McCormack, in particular, raised the point and Mark Lax did as well about the different trades that we needed and the evolution that we went through in the past. I will pick three here:

- I have mentioned operational support. I will not go into too much more detail. I think you can all see that a new category is required there.
- If I take security for example, I am not talking about someone at the other end of the leash on the dog. I am talking about security here as multilevel security; managing how we release this information that is the ‘crown jewels’ for the United States and for Australia and partner nations. So we need to have people who are trained in that doctrine, trained in those regulations and are able to do
it, people who can manage highly classified facilities and manage all that security information that we have. It is a challenge.

- Low observable technology will introduce, of course, low observable maintenance. Now, I am a ‘petrolhead’ from way back and I have sprayed a few cars myself, but I am the first one to realise that low observable maintenance is not about cranking up the air compressor and touching up the aeroplane. What we are talking about here is robotics that take off a certain number of microns of the surface of the aeroplane. They then measure it. They then reapply certain microns in a certain order of paint or low observable coating to the aeroplane. It is then measured internally using anechoic chambers and then measured against radars. We are talking about managing the fleet because you cannot do it all the time to every aeroplane. Then, if you have troop ‘Joe Bloggs’ go out there and drop a spanner on your aeroplane, that will have an impact on your signature that you have to take into account and manage. Imagine the cost of doing that. But imagine the cost of not doing that. I have got a picture on my wall of an F-111 in which I have flown that has one gold canopy and one clear one, and I look at that all the time and it reminds me of the importance of doing this. The F-111 came with low observable coatings on the canopy to stop your radar signature from being too high from head-on. We had no idea or we did not bother managing it and we let that technology go. We just did not bother about it and whenever we need to replace a canopy we did it and we ended up with mix matching there and we did not bother looking after the radar absorbent material within the aeroplane. We now have an aircraft for which we are going to pay billions of dollars as a premium for stealth and if we do not manage it that is a complete waste, not to mention the operational capability that will be degraded.

I will now say just a little bit about other ways the JSF will change the Air Force. I think many of you are aware that the F-35 has incredible sensors on board and it will greatly enhance the situational awareness of the pilots that fly it. It has low-probability-of-intercept data links and will data link that information then to other platforms, thereby making them smarter. The F-35 has more lines of code than any other aircraft, including the F-22, seven million lines of code airborne and seven million lines of code on the ground. So you are talking about an incredible amount of data fusion there. What am I saying though? I am saying that the F/A-18A/B crews when they go flying, as with the F-111 crews in the past, spend about 80 per cent of their time trying to take in information and convert it into situational awareness—trying to figure out what is happening outside and, through their different sensors, acting as the integrator and the fuser of the information—and only 20 per cent of their time are they making decisions. With the F-35, we are going to flip that on its head, and that is an incredible increase in capability.

Just a little bit about logistics; I will not dwell on it too much. What we are talking about is that, back in the 1970s, there were some very visionary engineers in the Air Force who thought about what computing technology could do to optimise maintenance and
managing aeroplanes. We have now got to the point where this is going to happen and it is going to happen because they have built the logistics system—and, as I said, there are seven million lines of code in the ground system—right alongside the aircraft to dovetail in. What we are talking about is a system, and I have seen it at Edwards, that plugs into the aeroplane or data links with the aeroplane before it lands, identifies a lot of what the problems are—not all of them, but many of them—orders the parts, works out who is the best technician in terms of training to actually perform that work, manages your workforce and also orders your support systems and makes sure that they are up to date etc., and also backfills behind the spare parts. So we are talking about an incredible system. We thought about it back in the 1970s. We tried to do it with Fleet Doctor¹ and other things in the 1980s, 1990s and 2000s, but this time it is working, and I have seen it with my own eyes. It will not be perfect from the word 'go' but it is, in fact, where we need to go in the future and it will change the way we do business.

Just a little bit about the multi-role capability of the JSF. I think we have had many multi-role aircraft in the past but with the JSF we are going to come the closest I think to the ability to use that multi-role capability on the same mission and to use it almost simultaneously. This next slide gives some examples of the imagery and the sensors that we can get through the JSF that can then be merged together and data linked down.

¹ Fleet Doctor was an integrated F-111 fleet scheduling tool, developed in the mid-1990s by the Strike Reconnaissance Logistics Management Squadron.
The ground moving target is very similar, but in a less sophisticated way I guess, than the JSTARS was in providing ground moving targets in various conflicts in the past. It gives you the ability to do Blue Force tracking, Red Force tracking and, of course, 360-degree electro-optical (EO), so being able to do reconnaissance as you go to do another mission. I predict that, before we get rid of the JSF, we are going to move to the point where the pilot is involved in some missions and other missions are being tasked, conducted and sent off board for processing without the pilot being involved in them. And that will become, I think, the norm.

Training is another area in which we are going to see vast changes. It is interesting that there is no two-seat F-35, so your very first flight in the F-35 is solo one. That is an interesting concept but, of course, we are getting a lot of simulators. We are getting 16 cockpit simulators for the F-35, versus the four for the F/A-18 we have now. And simulation will not only be for the aircrew, but it will be for the logistics and for the maintenance technicians as well. What will not change? I think Air Marshal McCormack touched on it, and that is the people. What we need is a whole bunch of innovative people to think about how we can implement the F-35 capability and how we can develop it. When I turned up on the F-111, all those people before me thought it was really a strategic strike aeroplane. It just did land attack and maritime strike, and we trained that way for years. No-one really thought that you could actually orbit one at altitude and use the Pavetack sensor to support Special Forces. Those ideas came out because we had innovative people within our organisation who thought up all these new ways of doing business. I have no idea how they are going to use the F-35 in its mature form. All I know is what is going to happen from the start with all the various missions we have depicted on the previous slide, but I think we are going to see some incredible stuff being done by the aircraft.

As I mentioned at the start, I realise that the F-35 may not be really appropriate at a history conference so I thought I would finish with a couple of slides that indicate there is a historical connection, as shown in this next slide:
I think most of you would recognise that the other aircraft in the photograph above is the P-38, the very first Lightning—the ‘Lightning I’ I will call it—which flew in World War II. It was designed in 1939 and it kept flying after the war as well. It did a whole bunch of missions and it truly was a multi-purpose fighter. They had strike fighter versions, night fighter versions and reconnaissance versions. The P-38 served in the Pacific and what many people may not realise is that it actually served with the Royal Australian Air Force. So the F-35 Lightning II is, in fact, the second Lightning to serve in the RAAF. The RAAF operated five P-38s, three of them served with the No 1 Photographic Reconnaissance Unit in New Guinea and up north, and two of them were attached to No 75 Squadron—so we actually have a Lightning connection to our fighter squadrons already. I must say that the P-38s did good service for those two years, but they went out with a bang. No 75 squadron, I think, crashed the last one on 1 September 1944 and that was the end of the Lightning.

Ladies and gentlemen, that was a rapid romp through the F-35 and I hope that you got something out of it. I know that there are other questions in the audience about different aspects of the JSF and I am happy to take those in question time. I am also more than happy for anyone to call over to Brindabella Park and I will explain it in more detail, so please take me up on the offer.

Ladies and gentlemen, thanks very much and I hope you do appreciate that the F-35 will be a quantum leap ahead in air power for us.
Good afternoon everybody, I think we have had a great day of discussion and a great day of talking about air power. It is always good to look at history. I mentioned the Mark Twain quote at the start that while history doesn't repeat itself, it sure does rhyme. I think with the last JSF presentation and the one on the F-111 there was a bit of rhythmic thing there that we need to work through and, probably, plenty of lessons.

Now, it is traditional in events such as this for the last speaker to sum up what has been said by the various presenters throughout the day. We have covered a lot of ground and we have had some very good speakers. Luckily, the introduction of social networking and modern media means that these presentations will soon be available to all through the Air Power Development Centre’s website. However, for the traditionalists in the front row, you will have to wait about three or four months until we actually publish the book next year.

I would now like to take a few minutes to describe what I think was the essence of the presentations we have heard today.

I think the important point that Sanu Kainikara made was that, although the RAAF has been at the vanguard of Australia’s defence because of our geography, the population really does not fundamentally comprehend its reliance on air power for deterrence and the defence of the country, and I think that is a great point to make. Unfortunately, I missed Michael Molkentin’s presentation, but they tell me it was about the AFC legacy, prehistory of the RAAF and how, although we were embedded into the British system, we managed to maintain our own identity and that was the genesis of the Australian squadrons. I have read Michael’s book and, for those of you who have not, I do commend it to you because it is a fascinating read with some great stories of the Australian Flying Corps.

John McCarthy covered the inter-war years and highlighted how the RAAF was a ‘show pony’. Yes, prewar it did struggle with the lack of resources and the technology to really maintain a viable force. I think John made a good point that it was actually pretty lucky and the guys that were around in the 1920s and 30s had to fight hard for the RAAF to maintain its status as a separate Service. Given that baseline, the expansion that the RAAF went through in World War II is probably even more remarkable. Chris Clark covered the three wars—three transformations involving equipment, organisation and people—which I think actually matured the RAAF. Those three wars over that 32-year period saw the RAAF grow into a force that had global reach.

I really enjoyed Dave Gardner’s presentation on the RAAF Museum. Maybe I should have answered a few of the questions that came up in the question time. The Museum
is fundamentally important to us as an educational tool to our future. I think it has probably taken us a little while to come to grips with that. The Air Force will continue to fund the Museum. We will have our fights in the system to get new buildings and things like that, but we will concentrate on maintaining our heritage purely as an educational tool for our future people in the RAAF.

Alan Stephens provided a fascinating presentation on the extraordinary changes that occurred in the RAAF during the 1960s and the unintended consequences—a great approach to that issue. Until I heard that presentation, I had not realised really what the 1960s had done and how much of a generational shift it was. I think the 40 per cent increase in personnel is something I would love to be able to emulate in this next generational change, but I am not sure we will be able to pull that off.

Mark Lax gave a quick run-through on the F-111. We are probably going to have to have a history conference on the F-111; I think it probably deserves an entire day, given its significance in the Air Force. For those who love the aircraft, it has given me as much trouble getting rid of it as it did in service. I think I am up to keeping about 15 of them at the moment to put all around Australia. I anticipated we might have a bit of trouble getting rid of it and thought we would keep, maybe, seven. Well, as people have been managing to walk into the Minister’s Office, seven has not been enough, so I think we are close to 15 now. As for the colour scheme, I think I have leaned towards the camouflage colour scheme because that probably is its best look. So, hopefully, that answers a few questions. I think somewhere down the track we probably just need to do an entire day on the beast because, for those of us who have had any involvement with the F-111, it was always a definite love-hate relationship. When it was working it was a great aeroplane, when wings fell off and fuel tanks exploded you hated it but, in general, it was an incredible strategic capability that we had.

Errol McCormack, after the Williams Foundation recruiting campaign at the start, gave a run-through on RAAF modernisation and the Defence reforms, and the lessons we have learnt from the past; I think it was more about the Australian Defence Organisation and organisational changes. But, again, I think the big point that came out of Errol’s presentation was that, while history does not repeat itself, it is rhyming pretty well at the moment with a lot of the features from the 1990s. The main point that I would take out of it is that I do not know whether we learn a lot of lessons sometimes; we observe them and tend to repeat some of the mistakes. So we always need to be on our guard for that.

Kym Osley provided a brief on the JSF and it was great to have that presentation. The JSF is on track. I am confident of success and the number is 102, and I should probably stop there. Kym brought out a lot of good points. In the discussion period there was no better point made than the fact that we really need to adjust our thinking over time, as Errol pointed out with his F/A-18 story. Well, I will give you an F-111 story to show how conservative we are and how slow we are to change sometimes. When the F-111 was upgraded to put digital avionics in it—I was a little late to the aeroplane—I remember flying one of the first strike training missions that I did in the aeroplane and
the crews had actually got the checks up to some high level of codification, which as a fighter pilot just drive me ‘spare’. So every time you turned the aeroplane there was a series of 10 checks that you went through with the challenge and response thing with the navigator, which I could never work out why we did it. My other question was that we were going on this sort of 1000-mile strike and we were turning about every 60 miles, which meant we were going through these series of checks every 60 miles, which again I could not stand. So I said, ‘Well, why are we doing this?’ and they said, ‘Well, on the old aeroplane with the analogue system, you needed to update the INS [inertial navigation system] about every 60 miles, so we’d go over these points.’ And I said, ‘OK, at what point when we got two laser ring gyros and twin GPS systems did we not realise that we no longer needed to do this?’ But to be honest with you, nobody had actually thought too much about that. I reinforce the point that was made here at the end, with the new technology we really need to be able to adapt to it.

Anyway I would like to thank all the speakers for their stimulating presentations. I think they were very informative and enjoyable, and I would like you to join with me in thanking them for all the effort they put in. I would really be remiss if I did not also thank the people from the team from the Air Power Development Centre who put the day together—Group Captain Rick Keir who is the Director of the APDC, Mark Hinchcliffe who is about to take over from him, and the rest of the team. I will not go through all the names; you know who you are. It takes a lot of work to put together a day like this and I think you have done a great job.

Finally, for all of you out there, I would like to thank you for attending the 2011 RAAF History Conference. I am sure we will do another one in 2013. Ladies and gentlemen, thank you again for your participation.