

# **The Flying Boat Era: Its Role as a Catalyst in the Development of Aviation and Social History in Australia**

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## **Abstract**

This thesis analyses the significance of the flying boat to modes of imperial British connectedness through aviation, with a specific focus on interwar Australia. The thesis demonstrates the evolution of the flying boats' contribution to Australia's development through their position at the crucial intersection of the nation's economic development and military defence. It argues that the flying boats provide a unique lens through which to explore Australia's changing sense of national and global connectedness in a period of rapid technological change.

The significance of flying boats to the commercial and social life of Australia should not be understated. However, recognition of their significance has been diminished by a tendency to focus exclusively on their role during World War II. The result has been to disassociate and understate the salience of the flying boat era as a whole. This thesis demonstrates the rapid evolution of aviation in the period and situates the flying boat in the history of Australia's then fledgling aviation industry. It argues that flying boats' early significance derived from its role in pioneering long-distance routes, and from the Empire Air Mail Scheme (EAMS), a programme instigated to transport first-class mail throughout the British Empire by air. The Empire Flying Boats were central to this scheme through which the British Government proposed to develop international air travel to its dominions, including Australia and New Zealand, initially financed by subsidised airmail. EAMS had an equally significant objective of maintaining Britain's links with and influence across its empire.

Flying boat operations were severely curtailed by the outbreak of World War II, as many of the aircraft were requisitioned into their respective British and Australian Air Forces. However, the demands for passenger travel remained high, in particular for military personnel. As a result, airmail surcharges were reinstated in order to reduce the quantity of airmail and increase the scope for passengers. The Short S 25 Sunderland was manufactured alongside the Empire Class flying boats to satisfy military demands for a long-range reconnaissance aircraft and this aircraft, and its derivatives, proved themselves to be highly effective in this role both for the RAF and its dominions.

This thesis demonstrates that the era of the flying boats' dominance was both a catalyst and a fundamental component in the development of aviation in Australia. In doing so it traces the increasing degree of airmindedness among the Australian public, and the gradual emergence of a distinctive airmindedness that differentiated Australia's aviation needs and imagined futures from those of Britain. The thesis also discusses how the initial

bias towards seaplanes transformed into a pragmatic acceptance of landplanes, resulting in the end of the flying boats' dominance in both civil and military contexts.

In this study I provide, for the first time, a concise discussion of flying boat operations in Australia during the first half of the twentieth century, situating their history within the broader evolution of Australia's sense both of imperial connectedness and national potentials through aviation.

## **Statement of Originality**

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Signature: \_\_\_\_\_

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## **List of Abbreviations**

|               |   |
|---------------|---|
| <b>AAHOF</b>  | Australian Aviation Hall of Fame              |
| <b>AAP</b>    | Australian Associated Press                   |
| <b>AFC</b>    | Australian Flying Corps                       |
| <b>AFC</b>    | Air Force Cross                               |
| <b>AHSA</b>   | Aviation Historical Society of Australia      |
| <b>APC</b>    | Australasian Petroleum Company Pty Ltd        |
| <b>ANA</b>    | Australian National Airlines                  |
| <b>ANZ</b>    | Air New Zealand                               |
| <b>ASV</b>    | Air to Surface Vessel (Radar)                 |
| <b>AVIAT</b>  | The Department of Civil Aviation (Australian) |
| <b>AWM</b>    | Australian War Memorial                       |
| <b>BAPO</b>   | British Army Post Office                      |
| <b>BOAC</b>   | British Overseas Airways Corporation          |
| <b>B.Sc.</b>  | Bachelor of Science                           |
| <b>CAC</b>    | Commonwealth Aircraft Corporation             |
| <b>CBE</b>    | Commander of the British Empire               |
| <b>CO</b>     | Commanding Officer                            |
| <b>C of A</b> | Certificate of Airworthiness                  |
| <b>Cpt</b>    | Captain                                       |
| <b>DO</b>     | Dornier Aircraft                              |
| <b>DCA</b>    | Department of Civil Aviation                  |
| <b>EAMS</b>   | Empire Airways Mail Scheme                    |
| <b>F/Lt</b>   | Flight Lieutenant                             |
| <b>FTS</b>    | Flight Training School                        |
| <b>HMAS</b>   | His/Her Majesty's Australian Ship             |
| <b>HMS</b>    | His/Her Majesty's Ship                        |
| <b>HP</b>     | Horse Power                                   |
| <b>HRS</b>    | Hours   |

|               |  |
|---------------|--|
| <b>IAL</b>    | Imperial Airways Limited   |
| <b>JATO</b>   | Jet Assisted Take Off  |
| <b>KLM</b>    | Koninklijke Luchtvaart Maatschappij N.V. (Royal Dutch Airlines)                          |
| <b>KNILM</b>  | Koninklijke Nederlands-Indische Luchtvaart Maatschappij (Royal Dutch East India Airways) |
| <b>MAEE</b>   | Ministry of Aviation Experimental Establishments   |
| <b>MBE</b>    | Member of the Most Excellent Order of the British Empire                                 |
| <b>MLD</b>    | Marineluchtvaartdienst (Royal Netherlands Naval Air Service – RNNAS)                     |
| <b>NAA</b>    | National Archives of Australia   |
| <b>NEI</b>    | Netherlands East Indies (now Indonesia)  |
| <b>NSW</b>    | New South Wales (Australia)  |
| <b>OUT</b>    | Officers Training Unit   |
| <b>OBE</b>    | Order of the British Empire  |
| <b>Pan Am</b> | Pan American Airways   |
| <b>PBY</b>    | Patrol Bomber (Consolidated Aircraft)  |
| <b>PMG</b>    | Post Master General  |
| <b>PNG</b>    | Papua New Guinea   |
| <b>POB</b>    | People on Board  |
| <b>POWs</b>   | Prisoners of War   |
| <b>PSF</b>    | Parti Social Francais  |
| <b>QANTAS</b> | Queensland and Northern Territory Aerial Services  |
| <b>QEA</b>    | Qantas Empire Airways  |
| <b>RAAF</b>   | Royal Australian Air Force   |
| <b>RAeC</b>   | Royal Aero Club of Great Britain   |
| <b>RAF</b>    | Royal Air Force  |
| <b>RAN</b>    | Royal Australian Navy  |
| <b>RN</b>     | Royal Navy   |
| <b>RNNAS</b>  | Royal Netherlands Naval Air Service  |
| <b>RNZAF</b>  | Royal New Zealand Air Force  |
| <b>RSL</b>    | Returned Services League   |

|               |                               |
|---------------|-------------------------------|
| <b>SQN</b>    | Squadron                      |
| <b>Sq/Ldr</b> | Squadron Leader               |
| <b>SWPA</b>   | South West Pacific Area       |
| <b>TEAL</b>   | Tasman Empire Airways Limited |
| <b>UK</b>     | United Kingdom                |
| <b>USA</b>    | United States of America      |
| <b>USN</b>    | United States Navy            |
| <b>USAAF</b>  | United States Army Air Force  |
| <b>W/C</b>    | Wing Commander                |



## Chapter 1: Introduction

Since before Federation, Australian historians have been fascinated by the concept of the 'tyranny of distance'.<sup>1</sup> Far from the United Kingdom (UK) and the imperial metropolis of London, Australians worried how to maintain a distinctively British identity in the antipodes. Politicians and military personnel in the UK and Australia alike were concerned about the new country's vulnerability to imagined invasion from the Russian, German and Japanese empires. Many commentators railed in the press about the military, moral and developmental threats posed by the millions of Asian people to the continent's north. Only careful border control, managed immigration from Anglo-Saxons, and close defensive ties with other white nations could protect the country.

Australians at the time of Federation were acutely aware of the growing power of the United States of America (USA). Australians had watched in fascination as the USA defeated Spain and took over the Philippines in 1898, providing a new proximate white ally (Lake and Pratt, 2008). Soon after, in 1908, the Great White Fleet from the USA steamed into Sydney Harbour. The fleet's presence emphasised the growing American power in the Pacific, but by implication, also highlighted Australia's distance from the UK. Connected only by long shipping lanes, communication and travel between Australia and the UK was attenuated at best. The result was a society that was acutely aware of both its desired British identity and its distance from the object of its imitation.

The development of the aviation industry transformed Australia's sense of self and place within the British Empire and the Asia Pacific region. For the first time, communication and travel were possible in a matter of days rather than months. The result challenged constructs of imperial connectedness, with a specific focus on the potential of the aviation industry into the future. Although rarely acknowledged, flying boats were core to the history of imperial and national evolution. They enabled a reconceptualisation of Australian commerce, communication and connectedness in the world.

### *Research Question*

This thesis traces the early part of the history of flying boats in relation to Australia until the conclusion of World War II. In doing so, it seeks to provide new knowledge regarding the flying boats' unique position at the intersection of Australian industrial and imperial identities.

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<sup>1</sup> A phrase that has entered the Australian vernacular but was originally made famous by historian Geoffrey Blainey in the title of his 1966 book, *The Tyranny of Distance: How Distance Shaped Australia's History*.

Situating the flying boats at the centre of analysis rather than at the periphery, enables new understanding of how transformations in the aviation industry were the catalyst for broader social and cultural change.

As its core research question, the thesis asks:

- What was the role of flying boats in the development of aviation and transforming a sense of imperial connectedness in Australia?

In answering this question, the thesis explores:

- The relationship between the British imperial hopes for flying boats, and the attitudes of Australian authorities.
- The role of technological advancement and that of key individuals capable of capturing public imagination.
- The relationship between the flying boats' commercial potential and their military utility.

In addressing these areas, the thesis demonstrates the unique role of flying boats in articulating a shifting sense of Australia's place in the region, empire and world.

### *Thesis Structure*

The thesis is structured chronologically, in order to draw together diverse narrative strands in an analysis that highlights evolution over time. I begin by providing the historical and analytical contexts for the interwar period during which flying boats had their greatest influence in Australia. I then discuss the four key periods by which flying boats can most usefully be defined, broadly relating to the two world wars which enables the key research questions to be analysed according to key features of those periods.

In discussing these periods, I cover the following subject areas:

- Commerce: Infrastructure and potential tourism.
- Destinations: Government direction and support; operational limitations of the aircraft; war and peacetime requirements.
- Government: Political governance, including direction of aircraft selection, and their deployment.
- Nations: international airline operations required co-operative arrangements with national governments.

## *Research Significance*

Throughout the research, there have been two overarching and interrelated elements guiding my direction. As a child, I lived in a suburb of Sydney directly adjacent to Rose Bay, the site of Australia's first flying boat base, and thus also the site of Australia's first international airport. The street I lived in was near the highest point of the suburb, with a prominent water tower located nearby, dominated by an elevated navigation beacon. This navigation beacon acted as a turning point for many of the arriving flying boats, dependant on the surface wind conditions in Rose Bay. Close observation of these arriving aircraft and their demonstrative passengers, who would wave from the windows, instilled in me a strong interest in aviation which resulted in a long and successful career with a major legacy airline. My intention with this thesis is to provide an insider's perspective where possible, and return to the aviation community, a short but concise history of the operation of flying boats in Australia.

Of equal significance to the inspiration for this work is the repatriation of my uncle as a POW to Sydney by a Catalina flying boat, on 20 October 1945. Anecdotally, I was present at this very important family reunion, however I was too young to have any recollection of the event. Sadly, the debilitation consequent upon his incarceration in Changi, Singapore, resulted in my uncle's passing in 1951, a mere six years after his return.

The scholarly significance of this research is to establish firmly, in a historical sense, the role that flying boats played in the enrichment of Australian society in the first half of the twentieth century. Distance, and its intertwined partner, connectedness, were central problems to be mastered by the Australian Government and its imperial overseers. Their chosen instrument was the emerging technology of aviation. Aviation was still in its infancy in a commercial sense, and the development of this industry produced many contentious issues. Prominent among those concerns was the reason for flying boats' initial precedence over landplanes, and why this was reversed at the completion of World War II. Closely related to this were the various roles that the UK played in influencing Australia's acceptance of flying boats.

This thesis provides a wide-ranging analysis of the flying boat era in Australia, and details how the significance of these operations assisted the fledgling aviation industry to develop and expand. The conclusions derived from this analysis will assist in reasserting the significance of the flying boats, previously understated by historians, and establish that the flying boat era was an intrinsic component in the development of aviation and cultural attitudes to flying in Australia. In so doing, this thesis will provide a concise reference point for future academic research.

## *Method of Research*

The research adopted a non-experimental format employing qualitative methodologies. Research strategies include the acquisition, review and systematic analysis of related historical literature. Commissioned, autobiographical, and academic airline histories have been analysed with an understanding of how each of these styles has been constructed to elicit an ordered response from the reader. The following airline histories proved particularly important:

- Qantas Empire Airways (QEA)/Qantas
- Imperial Airways
- British Overseas Airways Corporation (BOAC)/British Airways
- KLM Koninklijke Luchtvaart Maatschappij, (Royal Dutch Airlines)
- KNILM Koninklijke Nederlands-Indische Luchvaart Maatschappij (Royal Dutch East India Airlines)
- Australian National Airways (ANA)
- Tasman Empire Airways Limited (TEAL)/Air New Zealand
- Pan American Airways (Pan Am)

Field research included visiting air bases and museums associated with the establishment of flying boat operations. These visits were designed to contextualise, through first-hand experience, that which I had read about in secondary sources. Due to their proximity to my home, the two most obvious air bases to visit first, were the sites of Australia's first international airport, at the Rose Bay Flying Boat Base in Sydney, and the former RAAF Rathmines Air Base, 50 kms to the north-west of Sydney. Both of these sites are now essentially redeveloped commercial or recreational centres, retaining only minor museums and dedication plaques. However, on visiting the sites, and armed with a predetermined knowledge of their operational significance, I was able readily to visualise their origins. Interestingly, that visualization process was augmented in witnessing float plane operations, that continue on a full-time basis at Rose Bay and on a part-time basis at Rathmines.

Civilian museums were an intrinsic component in the research process, in that they provided evidence, in a static fashion, of the physical presence and dimensions of many of the aircraft described throughout my thesis. This assisted in augmenting the unwritten aspects of the commissioned institutional histories. The Powerhouse Museum, Sydney, houses Sir Gordon Taylor's original PB2B-2 Catalina Amphibian, "Frigate Bird II" that he flew to South America in 1952. The plane is representative of the aircraft type that he commandeered on his exploratory voyages across the Indian Ocean in 1939, as well as to Clipperton Island in

1944. Under the supervision of the Western Australian Museum, Broome in Western Australia retains sundry wrecks of Catalina, Dornier and Sunderland flying boats lying in-situ, which can be visited at low tide, and which are protected under the *Heritage of Western Australia Act 1990*. These visits, in particular, allowed me to envision more clearly the human aspects of what is evident in military history. The Solent Sky Museum, formerly the Southampton Hall of Aviation, UK, houses one of the original Short Sandringham flying boats that operated from Rose Bay, and still retains its original Australian livery of Ansett Flying Boat Services. Sadly, Australia retains no such exhibits of this aircraft type or its predecessors, which reinforces my desire to provide a written legacy of this timeline.

Museums dedicated principally to military aircraft such as the RAAF Museum, Point Cook, Victoria; the RAN Fleet Air Arm Museum, Nowra, NSW; the Imperial War Museum, Duxford, UK; the RAF Museum, Hendon, London, UK; and finally the Science Museum, London, UK, were visited with the intention of seeking a military perspective on the relevant aircraft types, and the potential for gathering additional secondary source material associated with individual exhibits.

Service histories and archival documents, provided by the National Library of Australia and the State Library of New South Wales, relating to both government and civilian sources have been consulted. As can be expected, many of the documents being considered in this research are written in a mode cognisant of the political realities of imperial power. As such, biases both pro and anti-government were both anticipated and identified. Similarly, archives from the Qantas Heritage Collection, the British Airways Collection and the RAN Heritage Centre were consulted with the intention of cross-referencing research material obtained from secondary sources.

Service organisations and communities, such as the Returned Services League (RSL) and the Sunderland Association, have been interviewed in attempts to locate personnel who may have been associated with this period of history. Given the time frame involved between the end of World War II and today, even the youngest personnel would now be nonagenarians, and as such it would be unrealistic to have high expectations of an individual's definitive recall.

I have thus synthesised a wide range of material from all of these sources and influences. By bringing together data from diverse primary and secondary sources, this thesis establishes that the flying boat era was indeed a catalyst in the development of Australia's aviation history. The story of the flying boats is also part of Australia's social history, and the thesis also correlates the flying boat era with significant developments in cultural attitudes to flying within Australia.

## Chapter 2: Literature Review

### *The Genesis of The Golden Age of Aviation*

World War I, 1914-18, revealed the potential military significance of aircraft for the first time. Prior to this war, aircraft had been widely viewed as machines that had the capability to bring about a smaller world by shrinking time and space and, in the process, increasing communication across political and geographical boundaries. They had caught the imagination of millions, as adventurers undertook ever longer journeys across fantastical distances. The potential connectedness of the modern world was revealed as never before.

The machines had been designed by civilians with the intention of providing civilian transportation, although their potential role as reconnaissance, fighters and bombers in an armed conflict was gradually recognised (Edgerton, 1991). The experience of World War I definitively transformed the manner in which aviation was imagined. No longer were planes solely a means to achieve altruistic civilian aspirations: aviation was henceforth intimately tied to the strategic objective of achieving military air superiority among competing nations. Despite this shift at a governmental level, following the end of the Great War the spectacle of flight continued to capture the imagination of civilians. In no small part, this was bolstered by a belief that aviation expressed the post-war optimism for international cooperation, decisive cultural change and social dynamism.

The jubilation and celebratory festivities that followed the end of World War I were soon dampened by the realization that many thousands of returning service personnel would have to be redeployed into civilian occupations. There was a surplus of military aircraft and technical expertise, and countries such as Australia had an excess of wartime pilots eager to transpose their newly acquired skills into civil aviation (Campbell-Wright, 2014). This influx of aviation experts provided the genesis of the world's 'golden age of aviation', which was to endure for 20 years until the commencement of World War II in 1939 (Williamson, 1996). In Australia, this golden age was also to spawn rapid developments within the military, including the establishment of the Australian Air Force on 31 March 1921. It was, however, also tied to developments in civil aviation in the British Empire, and both civilian and military considerations were closely entangled in the development of Australian aviation.

This chapter provides an analytical and historical framework to inform the analysis in subsequent chapters. It provides the critical context for the thesis through a discussion of three interconnected themes: the imperial context of the British world; the evolution of aviation awareness in civilian and military contexts; and Australia's unique attitude to flying boats from

a global perspective. In this way, the chapter provides a critical point of departure for the subsequent chapters and analysis.

### *Aviation and Imperial Consciousness in the British World*

Members of the Australian Imperial Force, returning home to Australia after the end of World War I, would have felt great pride in their achievements. Australians continued to identify strongly as a redoubt of imperial Britain, and many drew no distinction between their British and Australian identities. This was particularly strong for officers, many of whom had received their training in British institutions and would serve in postings throughout the empire in the coming years (Gehrmann, 2017). Although the war had been ruinously expensive for the United Kingdom (UK), Australia retained a resolute commitment to membership in that country's imperial association of territories. Indeed, most would then argue that the country's defence depended on strong association with the UK. Without this, it was hard to comprehend how Australia could defend its territory or represent its interests at the international level.

Imperialism, and what might be termed 'imperial mindedness', were manifestly strong in most sections of Australian society at the end of World War I. The latter term refers to the manner in which membership of the British Empire influenced ways of thinking and imagining self and community. The spirit of co-operation between the UK and one of its strongest allies, Australia, remained steadfast and was pervasive throughout public life (Blainey, 1966). The war had revealed the sharp divisions between the governing elite and the large number of Australians with Irish heritage, most markedly in the conscription debates and referendum. This reticence among Irish Australians did not translate into an alternative geostrategic alliance however, and the country's dependence on the United Kingdom for its defence capabilities remained largely unquestioned.

The sense of an enduring and vital connectivity between the UK and Australia was given renewed tangible form on 19 March 1919, when the Acting Prime Minister of Australia, W. A. Watt, proposed to the House of Representatives that an air race be held between the UK and Australia. Watt boldly laid down the challenge for aviation pioneers, when he announced that: '... with a view to stimulating aerial activity, the Commonwealth has decided to offer £10,000 for the first successful flight to Australia from Great Britain in a machine manned by Australians' (Cruddas, 2006, p. 57). In this manner, the Commonwealth Government sought to position aviation at the heart of the future imperial relationship. The public was no less excited by the prospect and imagined aviation to be at the forefront of communication within the British Empire in the coming decades.

The news of the race was received enthusiastically in the UK and Australia, and the former's Royal Aero Club Technical Committee was chosen to oversee the event. In addition to the condition in Watt's statement regarding the crew, another very significant condition detailed by the Aero Club committee was that 'the complete aircraft and all component parts had to be constructed within the confines of the British Empire' (Cruddas, 2006, p. 57). This requirement, and the imperative thereby produced for imperial cooperation, had a substantial influence on the direction of Australian aviation for the ensuing twenty-five years. As part of the resurgent popularity of imperial preference in relation to trade and consumption as well as military alliance within the British Empire, the policy makes some sense. However, the tensions and opportunities that were to manifest subsequently are at the core of my thesis.

Australia remained committed to its place in the British Empire but was not unaware of the changing geopolitical context of the interwar era. As Marilyn Lake and Henry Reynolds (2008) have compellingly demonstrated, Australia imagined its place in the world as one part of a 'global colour line' of white nations that were threatened by the increasing populations of Asia and Africa. Australia's politicians corresponded closely with key decision-makers in countries that imagined themselves to be similarly 'threatened', such as the United States of America, the Union of South Africa, Canada and New Zealand. Only through cooperation and connectivity with each other could these so-called 'Anglo-Saxon' nations remain at the forefront of global progress. Robust cooperation relied on communication between the various sections of an increasingly connected world.

There was a growing recognition of the importance of aviation for the development of trade and defence throughout the British Empire. The UK's Imperial Air Strategy was announced in the House of Commons in 1920, by the then Secretary of State for War and Air, Sir Winston Churchill. Contrary to written advice by the Civil Aerial Transport Committee to the British Government, Churchill stated that, 'Civil aviation must fly by itself; the Government cannot possibly hold it up in the air' (Higham, 1960, p. 31). Higham argues that Churchill's short-sighted statement became the key determinant of British air transport history for decades to come. Its consequences were to be far reaching throughout the empire.

This nascent policy of no subsidies to aviation, established in 1920, quickly proved to be financially unsound, resulting in all British airline transport companies ceasing operations to Europe by February 1921 (Lyth, 2000). The policy was partially reversed in March 1921, when subsidies for the carriage of passengers were introduced as a temporary respite. It was fully rescinded in April 1922 with the establishment of subsidies for individual airlines. The latter addressed the concerns of the Advisory Committee on Civil Aviation, which had previously been ignored by the government, and were partly a response to the reality of a



heavily subsidised foreign competition (Higham, 1960). The Imperial Air Strategy, which was to include the UK's dominions, was further revised in 1923, and had at its core the provision of subsidies to a monopoly state airline. Sovereignty of the air above the territories of the UK, a concept whereby 'the state should have sovereignty over its own airspace' (Fearon, 1985, p.25), was the rationale underpinning the implementation, expansion and eventual failure of this strategy.

The need to deliver mail promptly was another key reason for the expansion of aviation throughout the empire, and both civil and military aviation were strongly influenced by the development of airmail. Sponsored by the General Post Office, and under the authority of the Postmaster General of the United Kingdom, a pioneering British aviator named Gustav Hamel had established the world's first scheduled air mail service on 9 September 1911. Although only a distance of twenty-one miles, this inaugural air mail flight was the first of 16 flights to mark the coronation of King George V, delivering 130,000 commemorative souvenir postcards to the king (Royal Mail Group, 2011). This attempt to demonstrate the opportunities associated with the new technology was quickly taken up by others. Soon after, in the summer of 1912, a well-known 'propagandist for aviation', Claude Grahame-White, flew around the country in his 'Wake up England!' campaign (Holman, 2012). Grahame-White sought to promote the relative merits of the new technology and create an aviation awareness, or, as it was described in the interwar years, an 'airmindedness'.

Aviation's capacity to invigorate and modernise imperial governance continued apace in the years following World War I. Integrity of communication was increasingly vital for imperial coordination. The first scheduled international airmail service was pioneered by the Royal Air Force and the British Army Post Office between Folkestone and Cologne in December 1918, with the primary purpose of supplying a fast mail service to British troops stationed in Germany at the end of World War I. The British Government progressively extended these airmail services internationally to its dominions as it sought to expedite communication. The result was a degree of tension with the governments of the British dominions and colonies, who sought to exercise control over their own mail services, and their own policies more generally. I argue that the tension between the British and Australian governments in particular, which evolved as part of a changing imperial relationship between London and Canberra, was to become central to the development of the flying boats.

### *The Development of Global Aviation Awareness*

In the first half of the Twentieth Century many nations sought to popularise aviation as a powerful form of national propaganda. David Edgerton, in *England and the Aeroplane:*

*Militarism, Modernity and Machines* (1991), argues that politics was the main protagonist of aviation within England up until the 1960s, and that military aviation was the main beneficiary rather than civilians. Joseph J. Corn (1983) offers a contrary view in charting the path of national air-mindedness within the USA. He likens aviation's arrival to a form of secular religion of technology that transfixed a nation, benefitting both civilians and military alike. Regardless of who is deemed to have received the primary benefit, the advent of aviation was increasingly seen as a dynamic means to secure national progress.

This association of aviation with national progress was not confined to the English-speaking world. Peter Fritzsche's (1993) monograph explores the relationship between national development and propaganda, demonstrating that politics was similarly a fundamental component to the development of air-mindedness in interwar Germany. Indeed, he demonstrates that the concept was perceived as an opportunity for central government to assert greater control over regional and local politics within disparate jurisdictions. In a similar manner, Sean Kennedy (2000) reveals how partisan politicians in France sought to coopt air-mindedness into a politicised narrative of right-wing national regeneration. Scott Palmer (2006) argues likewise that air-mindedness was at the core of a political desire to transform Russian industrial underdevelopment so that it superseded Western European industry. In all of these examples, air-mindedness was a tool to imagine a national future and to facilitate national development. As with all such imaginings, the project risked appropriation by groups seeking to blame their opponents for a lack of national vitality, development or moral rigour. Perhaps surprisingly, air-mindedness was a concept that spoke to all of these concepts.

Interwar politicians were keen to embrace futurist technologies as a symbol of national moral and political rebirth following the horrors of World War I. Within the political discourses of a fearful interwar France, it was hoped that such a reinvigoration of the body politic would sustain the country both morally and militarily. Right-wing politicians, cultivating disdain for the ruling elites, concluded that 'the whole country, and especially its youth, had to become air-minded, lest countries such as Germany, Italy, Great Britain, and America attain dominance over aeronautical development and overseas flight routes' (Kennedy, 2000, p.3). The spectacle of aviation reinforced the connections between flying and national vitality. Populist politicians were eager for the drama and excitement that aeroplanes brought to an event, and used 'aircraft at mass rallies, [with other activities ranging from...] sponsoring development of flying clubs, to identifying famous airmen with their cause' (Kennedy, 2000, p. 2). The use of aviation as a tool for propaganda was not confined to France.

A resurgent German nationalism saw aviation both as a platform to enhance military preparedness and as a means to counter 'prognostications of doom' within the body politic

(Fritzsche, 1993). The creation of groups such as the Air Defence League and the German Air Defence sharply increased the resonance of air-mindedness in interwar Germany and provided opportunities for a weary populace to cooperate in a project of rebuilding national pride. Over time, air defence would mutate 'into an ambitious program of national renovation to rebuild Germany's military strength and, more important, to discipline the nervous energy and political passions of its citizens' (Fritzsche, 1993, p. 697).

Aviation offered not just a means for moral and national renewal, but also for economic development. Within the USSR, politicians and citizens alike hoped that aviation would lead the country out of its impoverished history into an era of industrial progress. Palmer suggests that 'of the twentieth century's many remarkable inventions, none exerted such powerful and lasting influence on the human imagination [in the USSR] as the airplane' (Palmer, 2006, p.1). As in other countries, enthusiasm for the developmental potential of aviation was limited by the pragmatics of limited resources and economic realities. In this context, the symbolism of social and economic progress that aviation offered was as important as the realities of industrial change.

The American experience with air-mindedness has been interpreted as profoundly different to that of Europe. Corn's interpretation of air-mindedness as a kind of technological religion, for example, strips it of overtly political associations so frequently recognised in European nations, and instead focuses on the romantic and religious experiences of everyday Americans. Peace and prosperity were the underpinnings of the tenet espoused by the arrival of this new technology, with the airplane promising to provide a fundamental change in society's affairs. Such a vision offered a similar trope of moral redemption and physical renovation outlined by the French vision. However, in Corn's work the might of the military is understated in favour of civilian heroes, such as Amelia Earhart and Charles Lindberg.

Robert Wohl (2005) concurs with Corn on the effects of the trans-Atlantic flight by Lindberg on 27 May 1927 in captivating a weary nation. In Wohl's view this single event orchestrated a turning point in the aviation history of the USA and empowered a cultural change in the nation. Clearly Lindberg's achievement became a matter of legend, even for those outside the USA, signaling as it so obviously did an ever-increasing global connectivity that brought vulnerabilities as well as opportunities. Within America, Lindberg was feted as he crisscrossed the country in a three-month aerial tour. This tour was reportedly witnessed by some 30 million adoring Americans, directly promoting air-mindedness and exposing people to the wonder of the aircraft (Wohl, 2005). Importantly, however, contrary to Corn, Wohl argues that the interplay of enterprise, political recognition of military potential and the media were actually key to the development of the American aviation industry. This crucial interplay of

industry, government politics, mass media and the military has striking parallels in the Australian experience. What distinguishes Australian aviation history between the wars, however, was the nation's situation in the British Empire.

British civil aviation, meanwhile, floundered in comparison to usage in both the USA and various European states for much of the same period. Between 1924 and 1939 the UK's main international airline was Imperial Airways. Gordon Pirie (2008) has drawn attention to the fact that 'detailed empirical studies of Imperial Airways passenger traffic are rare and dated' (p.65), which is itself testament to a lack of dynamism in the sector's own sense of its developing importance and to a distinct paucity of government interest in civilian aviation. However, Pirie does provide limited commercial passenger data, including figures for 1935 indicating that 7,103 passengers travelled on the Empire services (i.e. international routes to British empire countries) and that this number represented 12 per cent of the airline's total passenger traffic for that year. A wider perspective was provided by Sir Eric Geddes who remarked, as outgoing chairman of Imperial Airways, that in 1936 the airline flew a total of approximately 28 million miles, 55 per cent of which were outside Europe. By contrast, though, Pirie stresses that the British Imperial Airways total 'was half the passenger mileage flown by the German flag carrier Deutsche Luft Hansa on its internal European services' alone (Pirie, 2004, p. 67). This marked discrepancy points to broader differences between the evolution of British aviation and advances elsewhere in the world.

### *British Imperialism, Airmindedness and the Development of Aviation*

It is my contention that, notwithstanding some deliberate attempts to foster airmindedness through campaigns such as 'Wake up England!', the United Kingdom failed to pursue focused and systematic development of airmindedness in relation to imperial territories such as Australia. Despite this failure, there continued to be genuine potential to develop what might be termed 'Imperial Airmindedness' throughout the British Empire. Scott Palmer (2006) draws attention to this possibility when he includes among the markers of airmindedness 'the products of a nation's historical and cultural traditions' (Palmer, 2006, p.3). Given how readily it could draw on aspects of the Empire's sense of shared heritage, imperial connectedness through the new and exciting mode of aviation had a particular emotional appeal, at least among the Empire's British populations, and those who aspired to 'Britishness'.

In relation to the UK itself, there is certainly an interconnection to be discerned during the past century between periods of British enthusiasm, or lack of enthusiasm, for the development of civil aviation, and the ways in which aviation – civil and military – eventually proved intrinsic to many of Britain's extensive technological achievements. A similar

observation can be made across the global North, as 'airmindedness' or 'aviation awareness' became both a driver for and a result of rapid technological development. Significantly for this discussion, while Britain seems to have had a something of a failure of imagination in relation to fostering civil aviation for and in its many affiliated nations and territories, as we will see this was a gap that Australia, New Zealand and others would nevertheless fill for themselves. That Australians *did* develop a strongly aviation-based national imagery that became central to the nation's economic, social and cultural development.

According to Leigh Edmonds (1993, p.1), the term 'airmindedness' gained prominence during the interwar period as aviation pioneers and journal editors sought to educate the populace and governments as to the benefits of aviation. In his usage,

Air-mindedness is a state of mind. The people who founded aviation in Australia thought of it as a condition in the public consciousness which would encourage people to use aviation; to travel in aeroplanes and to send their mail and freight by air. (Edmonds, 1993, p.2)

In his recognition that cultural and social signification are key to the idea, Palmer (2006) elaborates on how the development of 'air-mindedness' was part of a global phenomenon in the interwar era, as new technologies wrought new ways of imagining national (and imperial) communities. He draws a careful distinction between how enthusiastic people *feel* about aviation, and how that enthusiasm is *realised* – and it is the latter that unfolds in relation to a nation's idea of itself:

I have chosen to employ "air-mindedness" in reference to the particular set of cultural traditions, symbols, and markers that, combined with existing political culture and social institutions, constitute a given nation's response to the aeroplane. Although Americans, Britons, Germans, and French may all be said to have been enthusiastic about aviation (or, air-minded), the specific manifestations of that enthusiasm (air-mindedness) were the products of those nations' unique historical and cultural traditions. (Palmer, 2006, p.2)

Australia's encounters with aviation and its potentials were occurring at the same time as it had undergone the processes of Federation, shared in the suffering of the Great War as a nation in its own right, was experiencing rapid population growth and economic change, and was deeply and broadly preoccupied with developing a sense of what it was becoming as an independent nation with a part to play in its region and in the world. Only by reflecting on the impact of all of this on a continually evolving relationship between the United Kingdom and Australia, and on the latter's emerging sense of nationhood, can Australian airmindedness be understood.

The connections (and disconnections) between British domestic and imperial strategy are clearest in the military context. In his comprehensive but controversial book *England and the Aeroplane*, David Edgerton (1991) suggests that 'while the standard view of England and the aeroplane is that both are liberal, civil and antimilitaristic, my view is that the commitment of England to the aeroplane exemplifies a commitment to armed force, science, technology and industry' (Edgerton, 1991, p. xxxii). Edgerton's thesis reverses what had become conventional notions of a nation in decline, arguing instead that 'British aviation of the 1930s [...] was overwhelmingly military, was strong, was strengthened by the demands of empire, and was central to the peculiarly modern war fighting strategy of the British state' (Edgerton, 1991, p. xx). Edgerton maintains that aviation was a very public technology in which the military coopted the press and specialist aviation journals to encourage an aviation consciousness among the general public from its earliest days. I am inclined to agree with Edgerton's analysis.

Somewhat fortuitously, Australia was a beneficiary of the UK's militarised aviation initiatives when, intent on controlling the direction of aviation within its dominions, Britain gifted 128 military aircraft to the Australian Air Corps in 1920 (Campbell-Wright, 2014). However, less fortuitously, how this provision of planes was enacted was undermined by a range of poor technological decisions made by the principal British operator, Imperial Airways, as a consequence of UK government interference. This had repeated ramifications for Australia. Although the gifted military planes were all landplanes, Fearon (1985) draws attention to the tension that was smouldering beneath the surface of Anglo-Australian aviation relations as to the appropriateness of flying boats for military and civilian purposes:

More important was the decision taken by Imperial Airways to order a relatively high proportion of seaplanes. The flying boats made by Short Brothers provided luxurious comfort for passengers but technically they were an example of misplaced investment. To operate they needed good weather and above all calm weather, they discharged passengers a long distance from urban centers which were their ultimate destination and finally they were more expensive to run than the modern airliner that emerged from the United States in 1933. (Fearon, 1985, p. 31)

The UK's preference for flying boats was not shared by other European states. The world's oldest continuously operating airline, KLM Royal Dutch Airlines, commenced operations on 17 May 1920. It continued to use landplanes throughout its long history, choosing to pursue an operational objective of providing the fastest possible service on its route structure (Lyth, 1991). Taking up Palmer's point about cultural markers, it is clear that the UK's reliance on its historical maritime traditions was at the core of its philosophical

commitment to the development of flying boats over landplanes. This commitment remained manifest in the UK aviation policy until the early years of World War II (Sims, 2000, p. 1).

In summary, the growth of aviation in the UK was enthusiastically encouraged by politicians and leaders of industry alike. Aided and guided by the British Government, aviation expanded exponentially. Crucially, however, technical and strategic developments in the interwar years were principally focused on the military implications of aviation rather than on the growing economic and cultural significance of civil aviation for passengers, trade and communications. The consequences of this for Britain's far-flung imperial possessions were little understood at the time.

### *Airmindedness and Australian Aviation*

In contrast to studies of Europe and the USA, airmindedness has not previously been researched in depth in terms of Australian aviation history. In his foundational piece, Edmonds (1993) argues that in the Australian context 'aviation only exists to serve social needs' (1993, p. 2). This reflects Edmonds' analysis that aircraft were essentially tools to enable the progress of commerce or warfare. With a similar understanding to Palmer's (2006), Edmonds further observes that 'the way a technology develops depends on the values and priorities of the social, political and economic environment in which it exists' (Edmonds, 1993, p.2). In Australia, that social need was manifested in the desire that aviation would assist in reducing the isolation of the country's major cities and outback communities from themselves and from Europe. What was far less clear was how this would be inculcated and the form that such development would take.

However, not all airmindedness was associated with progress in Australia. Brett Holman's (2013) monograph *Dreaming War: Airmindedness and the Australian mystery airplane scare of 1918*, reveals a 'growth of negative airmindedness thanks to the wartime press' (2013, p.180). Holman explains that the UK's experience of aerial bombardment by German airships and aeroplanes in World War I led to demands that politicians address the perceived threat of future aerial bombing. This concern about aircraft being used 'as devastating weapons of war' (Holman, 2013, p. 182) exposed a vulnerability in civilian defence that found worried expression in negative airmindedness among the British populace. Holman argues that Australians, exposed to wartime press coverage of what was happening in Britain and Europe, shared in this shift of airmindedness that saw aviation as a potential threat to civilian wellbeing and security. A more focused fear emerged in Australia in the last year of the war, based on numerous reports of obscure and, in some instances, false sightings of purported enemy aircraft during the autumn of 1918. This fear was initially provoked by even

earlier unconfirmed sightings of military aircraft attached to the German naval raiders, which were known to be patrolling the Eastern Australian coastline during July 1917 (Guillat and Honen, 2011).

Negativity regarding planes quickly eased in Australia after the end of the war. This was greatly aided by the mass popularity of Australian airmen, such as Sir Charles Kingsford Smith and Sir Gordon Taylor, whose great pioneering flights across the Pacific in 1928 and 1934 received worldwide acclaim (Gunn, 1985).

The development of a particular articulation of national airmindedness was a product of Australia's relatively unique position in the world. It was perceived, and perceived itself, as *isolated* both by virtue of distance from northern centres of power and trade, but also by virtue of being an island continent with no land bridges to connect it to the 'rest of the world'. These same conditions obviously also applied to New Zealand, and there was much to be gained from the two working together in their aviation development. But for Australians in the first half of the twentieth century, it was the distance from London that continued to carry the most significance, as too for New Zealanders. The British Imperial imagination was a powerful ongoing influence.<sup>2</sup>

Pioneering Australian airmen, Ross and Keith Smith carried the first airmail from England to Australia on 10 December 1919, and their arrival in Darwin was the culmination of a journey of some 12,000 miles. The journey was completed in 27 days and 20 hours, and as a result, the Smith brothers received the prize of £10,000 from the Australian Government (Fysh, 1965). They were congratulated in a telegram by the then British Secretary of State for Air, Winston Churchill, who noted: 'Well done. Your great flight shows conclusively that the new element has been conquered for the use of man' (Grant, 2002. p. 111). Thus, began a new chapter in imperial connectivity by air.

As noted earlier, airmail was a major contributor to the early development and expansion of aviation between Australia and the UK and was closely connected to cooperation between the two governments. Domestically, by November 1922 Australia had already instituted an experimental weekly airmail service between Charleville and Cloncurry in Queensland, a distance of approximately 577 miles. Further expansion of the domestic air routes and thus the supply of airmail continued, and inevitably expanded from the Australian mainland. In April 1931, Queensland and Northern Territory Aerial Services (Q.A.N.T.A.S.) assisted in establishing a successful experimental airmail service between England and

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<sup>2</sup> At least until the role of the USA in relation to the Pacific in World War II led many, including national governments, to turn their focus in that direction.



Australia (Fysh, 1965).<sup>3</sup> This service was made possible by almost a decade of cooperation between British and Australian airlines and by the growing recognition on the part of both national governments of the importance of civil aviation for the maintenance of imperial connectedness.

Firmly ensconced as a British dominion during the interwar period, Australia was heavily influenced in politics and commerce by the imperial imagination and UK decisions relating to its 'overseas territories', even as the newly 'independent' young nation continued to develop its own cultural traditions. This imperial influence was strongly evidenced in aviation when Imperial Airways (in collaboration with various dominion's airlines, including Qantas Empire Airways), instigated the first international scheduled air service to Australia in 1934. This scheduled air service was along imperial air routes and became 'the chosen instrument of Imperial policy' (Higham, 1960, p. xx). The service was subsidised by the respective dominion governments. As significant to it as passengers (and some forms of freight) was the important program known as the Empire Air Mail Scheme (EAMS).

The EAMS initiative was first presented to the British Cabinet in March 1933 by Sir Eric Geddes of Imperial Airways and was sanctioned by the British Government in 1934. The intention was to instigate a system that could distribute all 'first class' mail by air within the British Empire, at the rate of one and a half pence per half ounce. Sir Philip Sassoon, then British Air Minister, took a momentous decision when he specified that the design of the new aircraft for EAMS should be 'an improved Kent Class flying boat capable of carrying 24 passengers and half a ton of mail at 150 mph over 800 miles' (Sims, 2000. p. 24). His decision clearly had long-term ramifications for flying boats in Australia and established the context for a decade of contestation between the Australia and the UK regarding appropriate aircraft for long haul purposes.

There had been considerable debate internationally as to the relative merits of landplanes over seaplanes since the commencement of service aviation, with attitudes fairly evenly divided between positive and negative views (Knott, 2011). In the UK, the bias was heavily weighted in favour of flying boats however, based on the premise that their design placed less demand on infrastructure (given that there were boundless spaces to take off and land on water, whereas the availability of land-based airfields was limited in the UK at that time was limited). There was also a widely-held belief that flying boats were significantly safer,

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<sup>3</sup> Sir Wilmot Hudson Fysh, always referred to as Hudson Fysh, was one of the three founding partners of Q.A.N.T.A.S and later the Chairman and Managing Director of Qantas. Several generations of Australians were taught at school about Fysh's invaluable contribution to Australian aviation. He was also significant to aviation history, publishing a number of books, including a three volume memoir focused on the history of Qantas.

as they had the ability to alight on water in the event of an emergency (Cassidy, 2013). A further benefit was perceived to be the potential to develop larger and faster aircraft due to the unlimited accessibility of waterways associated with the UK's extensive coastline (Sims, 2000). These concepts, overlaid with that country's historic maritime traditions, predominated into the early years of World War II. This nautical history is still strongly reflected in the contemporary aviation industry in the language used to describe craft, as Vanhoenacker (2015) explains:

Today in the air we still speak a nautical language – of *forward* and *aft*; *cabins*, *galleys* and *bulkheads*; *manifests*, *rudders* and *trim*. We count aircraft by *hulls* and *fleets*. Our *port* and *starboard* wingtips are marked by red and green navigation lights, arranged as upon a ship. Our speed in the blue between two cities is measured in *knots*. What remains of us is our *wake* (Vanhoenacker, 2015, p. 4).

While this striking summary may well reflect the ready transference of language from one form of international transport to another, there can be little doubt that the discourses of aviation were strongly influenced by the particular significance of flying boats in the early development of the aviation industry, and in particular in the growth of long haul routes between the UK and its far-flung empire.

### *Academic Research on the Flying Boat Era*

To date, Australia's aviation historians have paid scant attention to the relationship between politics, airmindedness and the flying boat era. There is thus an opportunity for scholarly research that attends to the importance of flying boats to aviation history, and explores the connections between these aircraft, the influence of government policy and political decisions, and the development of airmindedness. My research makes a start on addressing this research gap. In exploring the role of the flying boat as a catalyst for the development of aviation in Australia, this thesis argues that its fate was closely tied to Imperial Airways' decision to choose it as a mainstay for the poorly constructed EAMS. That scheme, in its turn, created a loss of confidence in the UK's ability to match or outpace the aviation technology of competition in the USA.

We need also to notice that as Australia continued to develop its agricultural and mining industries, in particular, a growing proportion of the country's domestic aviation needs were in areas that lacked significant bodies of water of any kind. Clearly, conventional aircraft and landing strips were inevitably going to play a major part in Australia's economic, social and cultural life. The UK is a small island nation with a long coastline and many large bodies of water in its landmass, in the form of lakes, sea lochs and wide rivers. Australia is a vast

island continent with an extremely long coastline, but with few reliable large bodies of water beyond its coastal strips. These extreme geographical differences inevitably contributed to policy tensions with an imperially-minded UK government that held the view that it could maintain its hold over its dominions – both independent dominions and remaining colonies or territories – through a concentration on flying boats. My research demonstrates that the UK continued to hold this view long after it should have been clear that it was unrealistic, and that Australia would have to develop its own realistic aviation responses to its domestic geography and its international situation.<sup>4</sup>

The Australian government's support for the burgeoning aviation industry was manifestly strong, as exemplified by a statement made by Prime Minister Billy Hughes to the House of Representatives on 9 September 1920:

I am a fanatic in my belief in aviation... The air, that new element which man has now conquered, is but the sea in another form and it is on the sea and the air that we shall have to look for our defence... (Odgers, 1984. p. 47).

It is obvious that there were inextricable relationships between the Australian government, the development of aviation in general and the ways in which the flying boat era unfolded. Central to how these relationships were able to operate were *both* UK policy determinants based in notions of empire *and* Australian policy's more immediate grasp on its own national realities and priorities, which increasingly had less to do only with its place in the British Empire and more to do with the added demands of an independent nation's global trade relations and regional defence imperatives.

Hughes' initial enthusiasm is echoed in the Australian government's continuing unequivocal enthusiasm for aviation in all its forms. A similar enthusiasm is not discernible among historians. Aviation is frequently not a focus, or only a minor focus, in relation to twentieth-century Australian history in general from 1914–50, apart from occasional mentions in popular published histories of the importance of airmail, medical services and crop dusting, or the part played by aircraft in the defence of northern Australia in World War II. In academic research, in the past 40 years only 14 Australian history theses have been completed with a focus on aviation. Of these, only four could be construed as containing content that was solely focused on aviation and history. Theses about aviation have been inclined towards either military or civilian studies and only one melded military, civilian and social issues into a single document. For the flying boat, the scant attention is particularly pronounced even among aviation historians. There are several clear gaps in knowledge relating to Australian aviation

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<sup>4</sup> Other parts of the Empire faced the same need to tailor their aviation development to their specific needs.

history, including a total lack of scholarly research relating to the evolution of aviation attitudes in an imperial context, and also a total lack of attention to the flying boat, despite the disparate degree of policy attention it received from Britain in particular, in the first half of the twentieth century, and the impacts this had on Australian aviation history.

One way in which the impact of the imperial context *has* been considered is in the framework of the 'tyranny of distance' as deployed by aviation historian, John Gunn (1985). Blainey's (1966) notion obviously emphasises Australia's isolation from 'the Mother Country' and marginalises consideration of the implications of the continent's proximity to other Asian and imperial European possessions to the north (other than in terms of fear of invasion and racist isolationism). John Gunn's *The Defeat of Distance, Qantas 1919-1939* provides an example of dealing with aviation history through the idea of 'tyranny of distance', while taking account of the influence of British imperial attitudes on aviation development in Australia. His three-volume commissioned history of Qantas (*The Defeat of Distance, Qantas 1919-1939*, *Challenging Horizons, Qantas 1939-1954* and *High Corridors, Qantas 1954 -1970*) describes the formative years of Qantas. *The Defeat of Distance* and its accompanying volumes need to be understood as popular aviation history. While well-researched, the work cannot be regarded as 'academic research' given that it was commissioned by and produced for the company that is its focus, and because it is more journalistic than scholarly in its approach. One of the most prominent writers of Australia's historical aviation, Gunn had a military background as a RAN navigator and Fleet Air Arm pilot before working as a broadsheet journalist later in his life.

Gunn is, however, one of the only aviation historians who identifies the flying boat era as a defining period in the establishment of Australia's first international airline. He also highlights Imperial Airways' persistent attempts to coerce both the Australian Government (as an unwilling participant) and Qantas Empire Airways (as a willing participant) into the acceptance of flying boats, rather than the landplanes being manufactured in the USA. This persistence proved to be effective in determining investment in flying boats. Their initial operation was deemed to be successful and proved popular with the public. Yet it was the government in London that was the principal financier of the flying boats and whose policy directed the commercial path that Australian aviation would follow in at least two ensuing decades. The obsequious behaviour demanded of Britain's colonies by the imperial centre was to remain prevalent until the late 1950s (Blainey, 1966), but was already a source of tension in the early 1930s.

## *Conclusion*

European nations were understandably anxious to embrace aviation primarily for its potential as a war instrument, for defence and attack. Australia's airmindedness however, was principally founded on the belief that aviation would provide an answer to the country's geographical remoteness from Europe as well as its domestic distances. Australia's pressing desire to increase communications throughout its own continent came to hold a greater priority than any potential war in Europe or recognition of the part that aviation might play in the future of trade with Britain and Europe. In the interwar years, compared to Europe and the USA, Australia had a relatively limited railway system and few good roads (Blainey, 1966). As a result, air transport was viewed with great optimism by the Australian public, who hoped that it might provide a pragmatic answer to transiting the nation's vast distances expeditiously.

I argue that early Australian decisions to favour flying boats over landplanes were to a considerable extent impelled by the UK model of imperial airmindedness being adopted by governments in its dominions, even as Australians were developing a different kind of airmindedness in relation to their own social, cultural, economic and political values and concerns. Nevertheless, decisions prioritising flying boats had a significant positive impact on the so-called 'tyranny of distance' that Australia experienced in relation to the empire, and in particular, to the UK. Yet at the same time these decisions limited the capacity to deal with the long waterless distances that featured disproportionately in Australia's domestic transport needs. Despite other problematic elements, much debated in recent years, Blainey's (1966) work demonstrated the extent to which Australia's development was dependent on '[d]istance – or its enemy, efficient transport' (p.x).

Unfortunately for Australian transport, the continuing, inflated influence of the imperial imagination within Australia, combined with certain UK policy decisions involving donation of planes to Australia and subsidisation of aviation, tied Australian aviation policy to British airmindedness and British interests, and in doing so, tied Australia disproportionately to the flying boat, contrary to its own national interests. In the rest of this dissertation, I argue that the flying boats were decidedly inefficient compared to landplanes and their unnecessary dominance during the early development of civil aviation retarded the progress of aviation within Australia.

### Chapter 3: Australia and the Flying Boat, 1914-1939

#### *A Starting Point*

The first seaplane to arrive in Australia, and thus make a major contribution to Australian aviation history, was imported by Lebbeus Horden in early 1914. As a descendant of one of Australia's wealthiest families, Horden had adopted the newfound 'sport' of aviation and imported a Farman Hydro-Aeroplane (Figure 1).

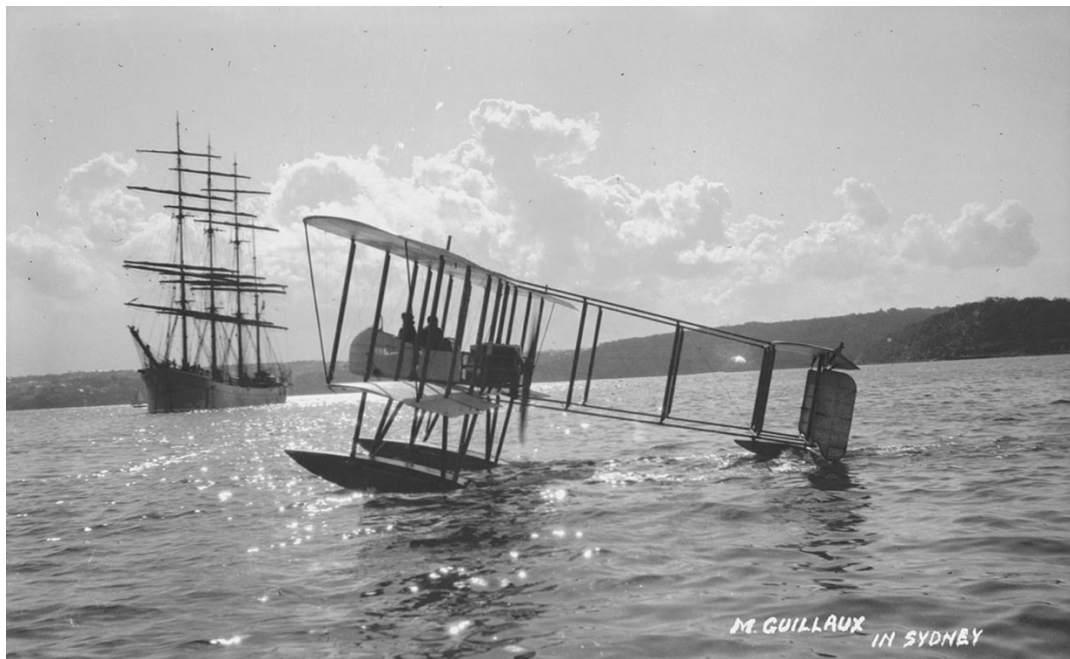


Figure 1: Farman Hydro-Aeroplane (Hydroplane) imported by Lebbeus Horden, flown by Guillaux 1914

Source: File No. 1040394, IE 1040386, Manuscripts, Oral History and Pictures, State Library of NSW

The plane was a product of the French workshop of Maurice Farman, and a prototype of the hydro-aeroplanes ordered for the Royal Naval Air Service (RNAS) in 1914 (Horden, 1985). Internationally renowned French aviator Maurice Guillaux, who was visiting Australia at that time, was engaged to conduct test flights in the aircraft. The first flight occurred at Double Bay in Sydney on 8 May 1914. With Guillaux at the controls and his manager/mechanic, Repousseau, as a passenger, the white winged aircraft took its first Australian test flight over Mosman and Manly, returning over Point Piper to land back at Double Bay. Subsequent flights on the same day carried Horden; the French Consul-General Alexander Chayet; and notably, with a view to arousing public interest in aviation, a *Sydney Morning Herald* correspondent. As they were flying over Australian naval warships anchored in Farm Cove, the correspondent, knowing of Guillaux's predilection for the potential of aerial warfare, quipped to him 'c'est

*dommage que nous n'avons pas des bombes!*' ('it's a pity that we don't have bombs!') ('Over the Ships', *Sydney Morning Herald*, 19 May 1914, p.11). The *Herald* journalist's report reflected a nascent air-mindedness that both celebrated the event and sought to alert the public to the ramifications of aircraft as weapons of war.

Horden succeeded in his attempt to develop a general aviation awareness in the citizens of Sydney. The seaplane, designed as a two-seat training and reconnaissance aircraft, drew the attention of representatives of the Royal Australian Navy who were among the many hundreds of spectators (Horden, 1985). They were evaluating the potential of the seaplanes, or hydroplanes as they were then known, inspired by the use of comparable aircraft in the UK. However, the Minister of Defence, Senator Edward Millen, was not of a like mind to his British counterparts and was unable to foresee the planes' usefulness for the defence of Australia. He stated pithily that he did not 'propose to rush and buy a number of seaplanes simply because a clever French aviator has demonstrated their utility' ('Aviation', Inspector General's Report, *Sydney Morning Herald*, May 21 1914, p.10). Senator Millen's statement seems to be an early attempt by the government to downplay the importance of aviation in the Australian defence umbrella.

At the conclusion of World War I, Lebbeus Horden continued his association with aviation and, with Harold Campbell Macfie, in 1919 became a founding member of the Aerial Company Limited. The principal aim of the company was to promote and expand aviation in Australia through the medium of commercial flights and a flying school in Sydney. The initial aircraft of the company were landplanes, however Lebbeus returned from a journey to England having purchased four seaplanes in 1920: one twin engined Short Felixstowe F3 air yacht (G-EAOT), one Short Shrimp seaplane (G-AUPZ) and two Curtiss Seagulls (G-AUCU and G-AUCV) (Lockey, 2014). Concurrently, Macfie also obtained the sole Australasian agency for Short Brothers aircraft. Two of these aircraft, the Curtiss Seagull (Figure 2) and a Short Shrimp achieved a place in the annals of aviation history in 1922, when they were dispatched to New Guinea to 'facilitate the exploration of the swampy hinterlands, the dense jungles and the lakes of the interior' (Horden, 1985. p. 345). Horden claimed that the aircraft used in this photographic expedition by Frank Hurley was the first aircraft to have flown in New Guinea. This was subsequently proved incorrect.

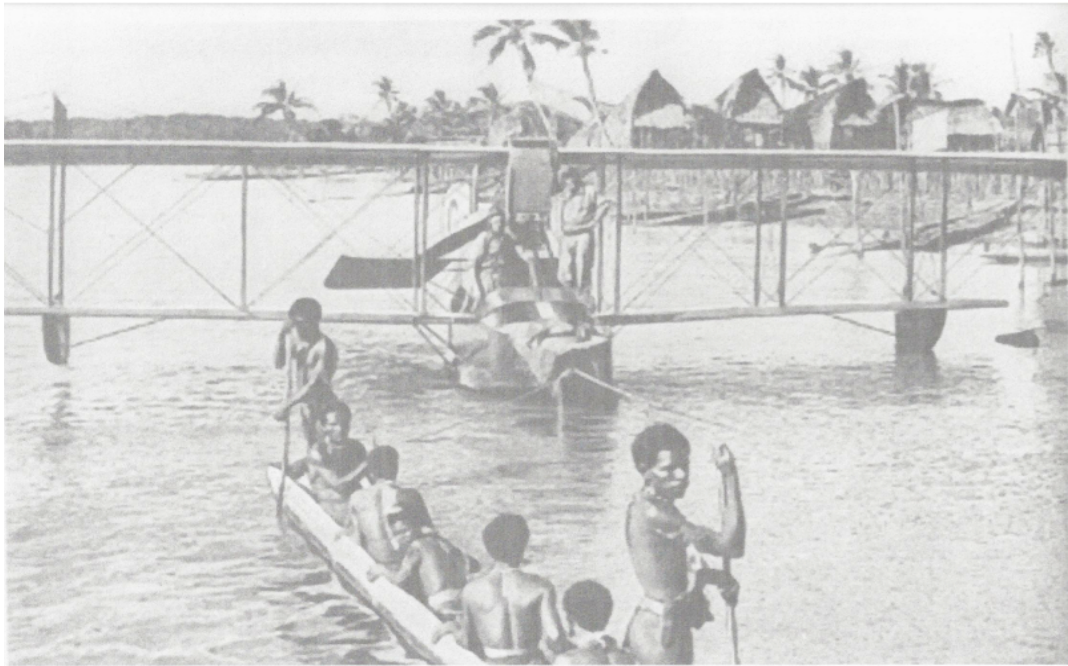


Figure 2: Curtiss Seagull in New Guinea, 1922

Source: Horden, L. (1985) *Children of One Family*, p. 346.

The tropical conditions proved unsuitable for the continued operations of the Seagulls and they were soon dismantled and returned to Sydney. Nonetheless, the use of the seaplanes by Australia in New Guinea signalled their potential application for advancing territorial claims through exploration.

Horden had a far-reaching vision for his newly arrived Short Felixstowe F3 air yacht. Powered by two Rolls-Royce Eagle VIII engines of 345 HP and capable of carrying up to 10 passengers over a range of approximately 500 miles, destinations as far afield as New Guinea, Darwin and New Zealand were announced. However, for reasons that are still obscure, the aircraft was never fully assembled, with the wings, empennage and engines remaining crated, and the hull finally relegated to an inglorious subsidiary role as a houseboat (Ellison, 1957).

Nevertheless, it is important to acknowledge Lebbeus Horden's contribution to Australia's aviation history, which was both subtle and significant. It is perhaps best captured by Frank Hurley's observation that he was 'a benefactor in the cause of science and aviation' (Horden, 1985, p. 348). As the pioneer of seaplane operations in Australia, Horden promoted the new field of aviation by ensuring that journalists were amongst the first passengers to fly in the aircraft and the journalists, in turn, described glowingly the potential benefits of aviation. Although Horden's ventures were beset by difficulties, his unstinting support for aviation ensured that air-mindedness began to grow among the Australian public.



### *The First RAAF Seaplanes*

As mentioned in Chapter 2, The British Government donated 128 miscellaneous military aircraft to Australia in 1920. Accompanied by sundry support equipment, they were known as the Imperial Gift aircraft (Williams, 1977) and were intended to form the nucleus of the planned Australian Air Force (Odgers, 1984). From a civilian's perspective, Horden would in all probability have regarded the Imperial Gift aircraft as a setback given that they were all landplanes. These aircraft did allow the newly formed RAAF to showcase their aircraft to the public, which fostered further awareness of aviation in general and military aviation in particular. One of these aircraft was an Avro 504K, which was converted to an Avro 504N floatplane. This aircraft, piloted by Captain Hippolyte 'Kanga' De La Rue, achieved an Australian first on the afternoon of 16 June 1920, when it became the first floatplane to land on Melbourne's Yarra River ('Seaplane "Lands" In Yarra', *The Border Morning Mail and Riverina Times* June 16, 1920, p.2).

To complement the Imperial Gift aircraft, the Australian government purchased an additional six Fairey IIID seaplanes, whose primary purpose was for training, survey and reconnaissance (Odgers, 1984). These six aircraft, delivered in November 1921 to what had become the Royal Australian Air Force, ushered in the commencement of more substantial seaplane operations in Australia. The aircraft were originally destined for the Royal Australian Navy (RAN), however as the RAN lacked the necessary personnel and facilities to maintain them, they were redeployed to the RAAF and based at Point Cook in Victoria (Williams, 1977).



Figure 3: RAAF Fairey IIID, A10-3, 1924

Source: Australian Defence Force (ADF) Serial Images Gallery; Album: Fairey IIID.

The performance and service histories of these and subsequent aircraft are pertinent to the evolution of seaplanes. The Fairey IIID was a single-engine biplane with a wingspan of 14.05 metres, built of wood and fabric, and powered by a 375 horsepower Rolls Royce Eagle engine. Two significant aspects of what quickly became evident as the seaplane's lacklustre performance were its maximum speed of 106 miles per hour and its range of 550 miles (RAAF Museum, 2010). These characteristics limited its survey and reconnaissance ability but, although they can be classed as aspects of poor performance, were typical of seaplanes at the time.

One of these Fairey IIID seaplanes, the A10-3 (Figure 3), entered into Australian aviation history in April 1924 when it became the first aircraft to circumnavigate Australia. Flown by Wing Commander S. J. Goble (Navigator) and Flight Lieutenant I. E. McIntyre (Pilot), the flight took 44 days and covered some 8450 statute miles in 93 flying hours (Parnell and Boughton, 1988). Given the overall impracticality of the Fairey IIID aircraft, I believe that this outstanding flight has been both overlooked and seriously under-remarked by Australian aviation historians. Of particular note is the part played by the remarkable achievement in increasing contemporary awareness of aviation among Australians, to which I return later in this chapter.

The circumnavigation was undertaken with federal government support and approval, but only after approximately four years of extended debate as to the method of transport required to survey the Australian coastline, both pragmatically and economically. On 25 February 1924, ministerial approval was received to proceed with an aerial circumnavigation using a RAAF Fairley IIID aircraft. The stated aim of the flight was to survey the Australian coastline for both civil and defence purposes with the intended flight scheduled to proceed primarily over an unchartered course.<sup>5</sup> Doubtless this flight could be taken to have constituted an exercise in RAAF propaganda, however it was a pioneering journey. Many difficulties were encountered *en route*, including engine malfunctions, tropical storms and crew illness. That there was more than publicity involved is in any case highlighted by the stated aims that accompanied the authority to proceed provided by the then Minister for Defence, Eric Kendall Bowden:

- A. To determine the effect of tropical conditions on:
  - (i) The performance of the engine and the seaplane;
  - (ii) The life of 3-ply floats, fabric, etc., of the aircraft,

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<sup>5</sup> National Archives of Australia, File Series A9376, Control Symbol 92

- B. To report on the practicability of utilising sea patrol aircraft, based at strategic points, in the carriage of mails etc., without undue interference with the regular training of crews;
- C. To ascertain to what height the south-east trade wind in the tropical area holds its surface direction (NAA, A9376, 92).

Early April was selected as the start date as it coincided with the end of the wet season in the northern part of the continent. Given that this imposed a fairly onerous time restriction, the detail that ensued in the preliminary organisation was a reflection of the professionalism and determination displayed in the end result. The flight departed Point Cook in Victoria on Sunday 6 April 1924 and proceeded anticlockwise around Australia. Preparations for the flight had involved substantial modifications to the aircraft including:

...an additional 40 gallon fuel tank, a supplementary radiator and extra vents in the cowling to allow for tropical temperatures; the airframe and fabric were treated with protective paint, anti-rust preparation and varnish to determine the effect of tropical conditions. (Parnell and Boughton, 1988, p. 51)

It is reasonable to assume that, while all of the modifications stated above played a prominent role in the flight, one of the most significant decisions was the provision of the additional fuel tank that provided increased endurance and distance in the very northern (e.g. from Cairns to Thursday Island; from Darwin to Broome) and southern parts of the continent (e.g. across the Great Australian Bight). Pre-flight planning also required the positioning of fuel supplies and provisions, in many cases with great difficulty, at designated sites along the intended flight path. The success of this facet of the flight can be attributed to the cooperation and enthusiasm provided by the Vacuum Oil Company throughout Australia (National Archives of Australia, A9376, 92). Spare parts and mechanics were located at the nominated ports of Thursday Island and Perth while the aircraft also carried significant spares for running repairs (NAA, A9376, 92). Overall preparation and organisation for this flight was meticulous given the limited timeframe. This mirrored the high degree of professionalism among all those involved. The journey was planned to proceed in three distinct stages:

- First Stage: Melbourne to Thursday Island;
- Second Stage: Thursday Island to Perth;
- Third Stage: Perth to Melbourne.

Inclement weather was a recurrent feature throughout the flight, resulting in demanding navigational conditions and many flight sectors conducted at levels as low as 100 feet. Although the elapsed time for the flight spanned 44 days, unrelenting weather conditions

accounted for the loss of nine days flying, while actual flying days were reduced to 20 days. Persistent engine malfunctions culminated in an earlier than expected engine change at Carnarvon, which required the replacement engine to be transported overland from [Perth](#) (NAA, A9376, 92). The crew experienced many physical discomforts and minor injuries throughout the journey, primarily due to the variety of environmental conditions that the flight encountered in traversing such a wide geographical expanse ('Purpose of the Flight', *The Age*, May 20 1924, p.10).

The ebullient welcome provided by a crowd of 10,000 people to the two aviators on their arrival at St Kilda's pier in Melbourne on 19 May 1924 was a reflection of the Australian public's burgeoning interest in aviation (Campbell-Wright, 2014). Minister for Home and Territories, Senator George Pearce, added praise to their collective achievements by observing that this flight:

...accomplished a great feat. It is worthy to stand alongside that of their compatriots, the late Sir Ross Smith and Sir Keith Smith. These men have shown that Australia is on the map in aviation. ("Round Australia", *Daily Examiner*, Grafton, 20 May 1924, p. 5)

The remarkable flight was duly acknowledged by the Royal Aero Club of Great Britain, who awarded the two airmen the Britannia Challenge Trophy of 1924 for 'the most meritorious performance in the air' (RAAF, Air Power Development Centre, May 1924). Additionally, both Goble and McIntyre were made Companions of the British Empire (CBE) in the King's Birthday Honours list of 1924. In recognition of this seaplane flight around Australia, McIntyre was also awarded the Oswald Watt Gold Medal by the Royal Federation of Aero Clubs of Australia (Milln, 2012).

Although the individual aviators received a range of significant recognition for their pioneering flight, over time the overall achievements of the journey have been relegated into a forgotten corner of Australia's aviation history. However, in a seminar presented in April 2012 on behalf of the Air Power Development Centre of Australia, Chris Clark proposed that the seaplane circumnavigation of 1924 was 'a useful contribution to developing a maritime strategy, in as much as it helped extend knowledge of the operating environment across our northern coastline at a time when practically nothing was known about this region' (Clark, 2012, p. 5). The very extensive and well-documented reports from both the aviators concerned and personnel located at the various staging points through the flight, bear testament to Clark's observation. Indeed, the knowledge gained by this flight was to act as the basis for a revised defence strategy, in particular the new concept of a maritime patrol presence. To this date, maritime air reconnaissance remains one of the cornerstones of Australia's defence capability.

Goble and McIntyre's flight provided the first definitive evidence of an emergent strategic military airmindedness in Australia and was to act as a catalyst for that which was to follow. I strongly believe that the importance of this flight needs to be revisited by government and aviation history to ensure that it receives its rightful recognition of being one of the most important pioneering flights in Australia's aviation history.

The story of Goble and McIntyre's seaplane circumnavigation also reminds us that in the period between the wars Australian aviators were at the forefront of long distance flights worldwide. The Australian public of the time were strongly aware of this, which encouraged increasing degrees of airmindedness. Australia's encounters with distance by virtue of our geography contributed to our development of particular expertise in the strategic and technological challenges of long distance aviation.<sup>6</sup>

### *The Wackett Widgeon*

Another contribution to Australian water-based aviation in the early 1920s was the work of Lawrence James Wackett, a Squadron Leader in the RAAF. He initiated the future of Australian domestic aircraft production when in 1923 he commenced design of the Wackett Widgeon I (Figure 4 below). The Widgeon I should also have a significant place in Australia's aviation history, at least partly due to the ingenuity and perseverance of Whackett himself. In an endeavour to gain knowledge and experience in all matters aeronautical, as a young Major in the Australian Flying Corps (AFC) Wackett was posted to the Royal Flying Corps Armament and Experimental Station at Martlesham Heath in England (Williams, 1977). He was an experienced and well-regarded aviator, who demonstrated a quest for technical knowledge beyond that of his average contemporary from an early point in his chosen career. His initial military service with No. 1 Squadron AFC in Egypt during World War I revealed his mechanical and inventive aptitude, which enabled him to design a mechanism that allowed a machine gun to be fired through a propeller's arc, similar to that in operation on Fokker aircraft. These skills were recognised by General Sir John Monash, Commander of the Australian Corps, who subsequently asked Wackett to design further on-board aircraft equipment that would allow the resupply of ammunition boxes that could be parachuted to allied troops (Allen, 2016).

In 1924 Lawrence Wackett was placed in charge of the Experimental Section of the RAAF at Randwick in New South Wales. This was the first Experimental Air Station in the Empire outside of the United Kingdom (UK) and was based broadly on the Experimental

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<sup>6</sup> We should perhaps note that this is an area in which Australian airlines, in particular Qantas, have continued to take a leading role, and in which Australian passengers have become global experts.

Station at Martlesham Heath. Having earned a B.Sc. from Melbourne University, one of his first briefs as Commanding Officer (CO) of Randwick Station was to design a flying boat for the Civil Aviation Branch of the Department of Defence Control. It would come to be known as the Wackett Widgeon, ('World of Wings', *The Telegraph*, Brisbane, July 12 1924, p. 14).



Figure 4: Person inspecting Wackett's Widgeon flying boat, NSW, circa 1925

Source: National Library of Australia, nla.obj-162598851.

The design of the aircraft commenced in 1923, when Wackett was regarded as 'the most knowledgeable man in Australia on the construction and maintenance of aircraft and equipment' (Williams, 1977, p.141). Designed initially as a seaplane, construction started in March 1924. The Widgeon contained an unusual but pragmatic detachable inverted wooden dingy moulded into the upper fuselage (Wikipedia, 2015). With Wackett piloting, the plane took its first test flight on 7 July 1925. This did not go well: the aircraft stalled on take-off, resulting in damage to the aircraft and, no doubt, to the pilot's/designer's pride. Some five months later, on 3 December 1925, Wackett once again took off from Botany Bay near Mascot, with his successful flight lasting ten minutes. Subsequent modifications included converting the Widgeon I for amphibious operations (as seen in the wheels in Figure 4) and replacing the 240 horsepower Siddeley Puma engine with a 300 horsepower ADC Nimbus engine. As it was

designed and constructed for a government body, it adopted an out of sequence registration of G-AEKB (Crick and Cowan, 2015).

The Civil Aviation Board subsequently acquiesced to a request from the RAAF to have the aircraft transferred 'to No. 1 Flying Training School (FTS), where it would be assessed for suitability as a flying-boat training aircraft' (Crick and Cowan, 2013, p.10). The Widgeon continued intermittently in this role at No.1 FTS from 1927 until October 1929, when it was unceremoniously broken up and burnt at Point Cook, having logged only 99 hours of flying time (Crick and Cowan, 2015). The design of Widgeon 1 had not proved particularly successful, but it was the basis for further development. The modifications applied to the Widgeon I were incorporated into a second and improved version of the aircraft known as the Widgeon II. This was a larger aircraft designed specifically for RAAF use, powered by a 440 horsepower Armstrong Siddeley Jaguar engine and capable of seating up to six passengers. Being amphibious, it had its first flight from the land aerodrome at Mascot on 21 February 1928. The Widgeon II was a substantial improvement on the Widgeon I, as demonstrated by Wackett who flew the aircraft extensively. He proved its capability by flying it on a 9,000 mile (14,000km) journey around the Australian continent in 1928, summing up the journey as "[q]uite uneventful, but very valuable from more than one point of view" (Widgeon II, 1928). The Widgeon was not without its own specific problems however, and a number of noteworthy flights were aborted due to ongoing mechanical deficiencies.

The Wackett Widgeon II also had a less than glorious demise, when it crashed on takeoff Port Phillip Bay near Point Cook on 6 January 1930. All three occupants were killed, including the Honourable Captain Hugh Grosvenor who was the ADC to the Governor of South Australia ('Air Tragedy In Victoria', *The Sydney Morning Herald*, January 7 1930, p.11).

The significance of the Widgeon I and II is that they were the first amphibious seaplanes that were designed and constructed in Australia. Importantly, this also took place at Australia's first Experimental Air Station in Randwick. However, the histories of both aircraft suggest that the design and operation of these machines met with little real success. Indeed, having commissioned the construction, the RAAF made no additional orders for the Widgeon II. Regardless, Sir Lawrence Wackett, KBE, DFC, AFC 'was knighted in 1954 in recognition of his outstanding contribution to the Australian aircraft industry in peace and war' (Australian Aviation Hall Of Fame, 2016). In fact, Wackett went on to be recognised as one of the foremost aircraft designers of his time who through his foresight and management provided a very substantial contribution to the development of aviation technology and public awareness of the craft in Australia.

### *The Italian Connection*

Airmindedness in Australia was further stimulated by the arrival in Melbourne of the Italian nobleman Vice Wing Commandant, Marquis Francesco de Pinedo, and his mechanic Ernesto Campanelli on 9 June 1925 (Campbell-Wright, 2014). Flying a single engine, five seat Savoia-Marchetti S-16 flying boat that had been supplied by the *Regia Aeronautica* (the newly formed Italian Air Force), de Pinedo was in Australia representing the Italian Government. He adopted a strong 'advocacy of the seaplane and its capability to make global air travel feasible' (Walker, 2016, p.1). They had departed the Savoia factory works at Sesto Calende, located on the southern tip of Lake Maggiore in the Lombardy region of Northern Italy on 29 April 1925. The two men's journey traversed a similar route to that taken by Ross and Keith Smith's Vimy, although their course deviated at Kupang in Timor, whence their flying boat proceeded to Broome on the Western Australian coast, arriving there on 31 May (Scott, 2013).

In completing this crossing of the Timor Sea to Australia, the Savoia-Marchetti entered the annals of Australian aviation history as the first flying boat and only the third aircraft to arrive from Europe by air (Scott, 2013). The flight then continued anticlockwise around Australia, stopping at various ports until it eventually arrived at St Kilda in Melbourne. There the two men were greeted enthusiastically by 30,000 well-wishers, definitively signalling the growth of aviation in the public consciousness. Elaborating on the expanding notion of airmindedness and in appreciation of the supporting role that the Italian Government had played in this flight, the Prime Minister of Australia, Stanley Bruce, sent a wireless message to the Prime Minister of Italy, Benito Mussolini:

Government and people of Australia greatly appreciate and most cordially reciprocate your greetings. We join in paying tribute to Commandant de Pinedo for his wonderful flight, and congratulate you upon the great success your air service has achieved. We feel that in emulating the success of our own countrymen Commandant de Pinedo has added one more link to the common bond of interest and friendship which unites Australia and Italy. (Follett, 2017, p.6)

Maintenance on the Savoia was subsequently carried out by RAAF mechanics at Point Cook and on 17 July De Pinedo and Campanelli departed Melbourne for Farm Cove on Sydney Harbour, arriving shortly after 4pm ('Departure From Melbourne', *The Brisbane Courier*, 17 July 1925, p.14). Celebrations were at that time being prepared for the arrival of the US Naval Squadron in Sydney on 23 July. De Pinedo, not wishing to be embroiled in these activities, wanted to depart prior to the arrival of the fleet.



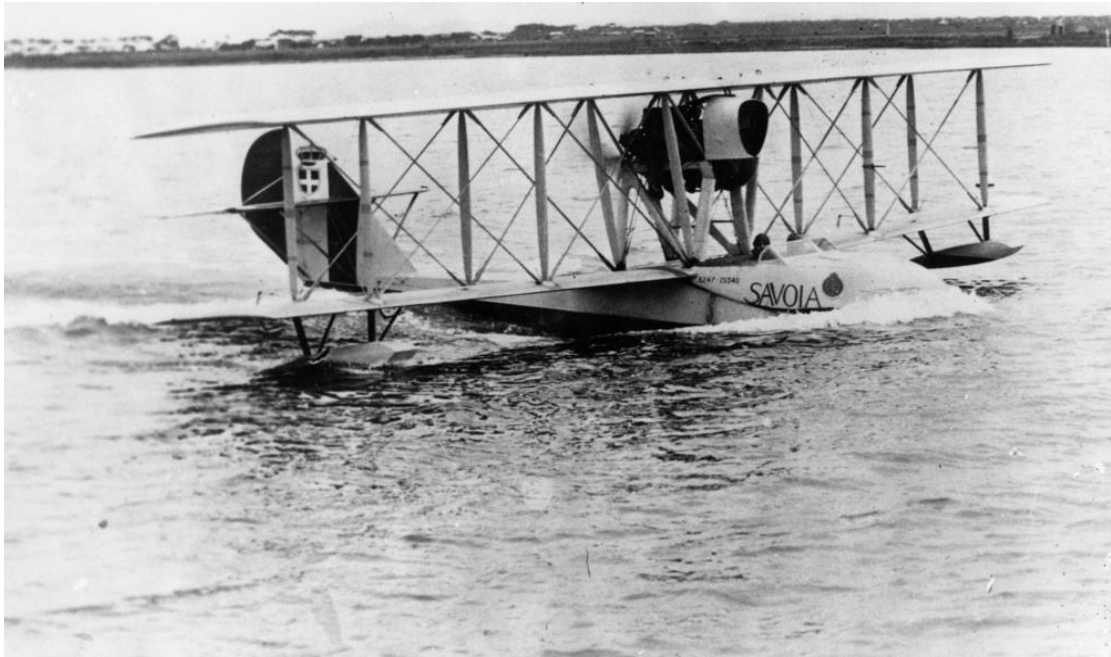


Figure 5: Gennariello, de Pinedo's Savoia-Marchetti's S16 seaplane, landing on the Brisbane River, 1925

Source: Item is held by John Oxley Library, State Library of Queensland. File: StateLibQld. 1 161751 Digital Image Collection, Created 1 January 1925.

The Savoia, named *Gennariello* after the patron saint of Naples, took off out of Sydney for Brisbane on 20 July only to return due to excessive engine vibration. A second attempt was made on 25 July with similar results, so the aircraft was beached at Rose Bay. Repairs were carried out over a period of two weeks and the aircraft proceeded north to Brisbane on its return journey to Italy via Asia on 6 August 1925 (Jones, 2007).

The Savioa-Marchetti S16, arrived in Tokyo on 26 September 1925. In so doing, it opened the first air route between Australia and Japan. The Japanese people recognised that this was a very significant aviation voyage, and warmly welcomed the two Italian airmen. After an engine change in Tokyo the aircraft arrived in Rome on 7 November 1925, where the flight was regarded as a remarkable achievement, having travelled over 33,500 miles without a major incident. De Pinedo, who was head of the Italian Air Force (Campbell- Wright, 2014) could claim the honour of completing the first return flight between Europe and Australia (Fiore, 2000).

De Pinedo's foresight in ascertaining that the 'future of long distance aviation would involve the use of flying boats' (Scott, 2013, p. 1) was recognised when 'the Fédération Aéronautique Internationale awarded him its inaugural Gold Air Medal' (Scott, 2013, p. 2). His outstanding achievement was also acknowledged by Italy's King Victor Emmanuel III, who conferred the title of *Marchese* (Marquis) on him.

### *Additional RAAF Seaplanes*

Australia had long been dependent on British naval support for the empire to ensure its own defence. From Federation (1901) Australia's military forces were regarded 'as a reserve for imperial use in the event of a large scale European war' (Clark, 2012A). Independent strategic thinking within the Commonwealth Department of Defence was limited by the desire of early Commonwealth governments to secure a more robust defence of the Australian continent, rather than thinking about the deployment of Australian forces further afield in our region in order to address a potential threat before it reached our immediate vicinity. Clark (2012A) argues that there was 'a maritime strategy in play in Australia before and more particularly after World War I' and further, 'this maritime strategy was the dominant strategy imperative and driver in that period' (Clark, 2012A, p. 1). To that end, the Australian Government announced their intention in 1924 to purchase a seaplane carrier that would be operated by the Royal Australian Navy and be equipped with amphibious aircraft. Six Supermarine Seagull 111 amphibians were ordered in April 1925, which was the minimum amount required for training personnel for the new aircraft carrier and to assist in survey work on the Great Barrier Reef (Clark, 2012A). These aircraft were to replace the ageing Fairey 111Ds in the Seaplane Training Flight. The first new aircraft (the A9-1) made its initial flight in Australia on 26 June 1926 (Geale and Cowan, 2013). As the Royal Australian Navy did not yet have a dedicated air arm, the Seagulls were allocated to the newly formed No.101 Fleet Co-operation Flight at RAAF Richmond in New South Wales. The group was in turn dispatched to Bowen in Queensland and tasked to work with the survey ship HMAS Moresby on the Great Barrier Reef Project (Isaacs, 1977). Interestingly, although these aircraft were replacing the well-worn Fairey IIIDs, their size and performance were very similar. It had, however, been determined that they were 'better suited to the task of assisting the Navy's program for surveying the Great Barrier Reef' (Clark, 2012A. p.1). An additional three Seagull 111s' were acquired from the Royal Air Force in 1927, allowing the survey work to be extended to New Guinea later that year.

Although there was not yet a detailed design for Australia's first aircraft carrier at the time, the Commonwealth Naval Dockyard at Cockatoo Island, Sydney submitted a tender of £835,000 for its construction in February 1925 (Jeremy, 1998). The British Admiralty was chosen to finalise a design specifically for the RAN, which was to include three hangars and facilitate the carriage of nine aircraft. The ship was named HMAS *Albatross*. Its designer, Stephen Payne, observed that 'the hull was designed around three holds, three cranes, and 21 knots' (Issacs, 1977, p. 3).

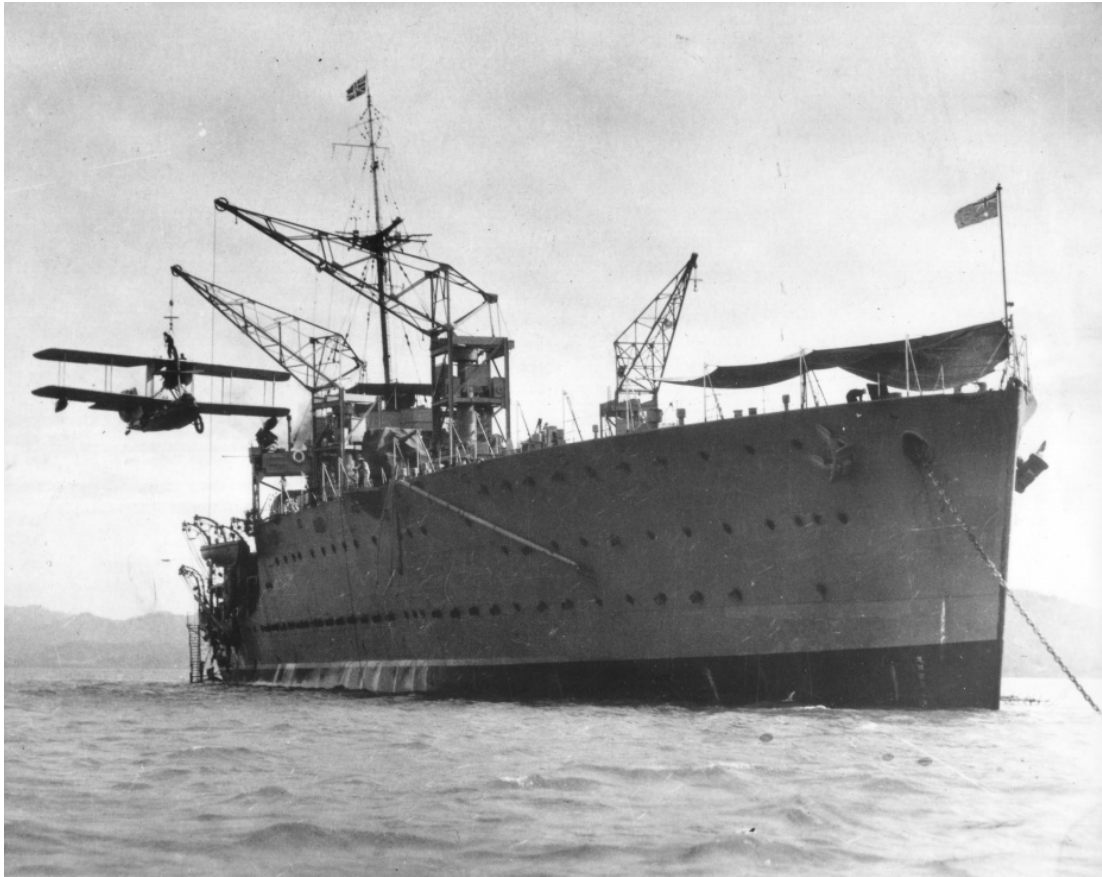


Figure 6: *HMAS Albatross* lowering one of her *Seagull III*s onto the water

Source: navy.gov.au (*HMAS Albatross 1*).

The concept that Australia's troubled manufacturing industry could embrace such a unique project as the *Albatross*, at that point the largest warship built in Australia, was reflective of the government's urgent desire to expand Australia's ship building industry. Unorthodox in its design, and having a final construction cost of £1,018,925, the carrier was launched by the Governor General's wife, Lady Stonehaven, on 23 February 1928 (Issacs, 1977).

*HMAS Albatross* was commissioned on 23 January 1929, and the six *Seagulls* that had recently completed their Barrier Reef survey were hoisted on board at Geelong, Victoria, on 25 February. These aircraft were now to change their role from survey to reconnaissance, torpedo spotting and generally assisting the Navy in pursuing a maritime strategy for the defence of Australia (Issacs, 1977). This joint arrangement between the deployment of RAAF aircraft and personnel to the RAN was to operate continuously and effectively up to 1933 when the *Albatross* was paid off into reserve (Clark, 2012).

### *The English Connection*

The pioneering English aviator Sir Alan Cobham played a pivotal role in the British effort to entrench *imperial* air-mindedness among British and the Australian publics. Partly in order to demonstrate the potential of aviation to the new world, long distance flights such as those performed by Ross and Keith Smith and de Pinedo, were becoming more frequent. Cobham performed one such flight with his friend and engineer A. B. Elliot. Cobham was piloting a single engine De Havilland DH 50J aircraft fitted with floats (Figure 7). They departed the River Medway in England on a survey flight to Australia on 30 June 1926.

Cobham's rationale for a seaplane is best provided in his own words:

The reason for taking a seaplane on this flight was chiefly one of protection ... From Calcutta to Australia it is simply impossible to land anywhere but on a specially prepared aerodrome. I did not like to contemplate being caught out in a severe monsoon over ... tropical jungle, with no prospects of landing – and so decided that, although a seaplane has many disadvantages as compared with an aeroplane, it would certainly be a far more practical and safe proposition. (Cobham, 1926. p.1)

The dangerous nature of the flight to Australia was highlighted when, flying low over the banks of the Euphrates in an attempt to avoid a dust storm, his aircraft was fired on by Bedouins and his friend and mechanic, A. B. Elliot, was fatally wounded. Having picked up a replacement engineer, Sergeant Ward, at Basra, Cobham continued his journey southwards.



Figure 7: Sir Alan Cobham's De Havilland DH 50J fitted with floats

Source: Cobham, A. J. (1926) *Australia And Back*, p. 85.

The 'survey' aspect of the flight is captured in the fact that it was carried out in the monsoon season to determine whether it would be possible to conduct similar flights on a scheduled basis throughout the year (Cobham, 1926). It is clear from this that British aviation had firm goals beyond the boundaries of Europe and Asia, and that such goals were unarguably tied to objectives of maintaining imperial integration.

Cobham and Ward arrived in Darwin on 5 August 1926. There, the floats were removed and the aircraft was reconfigured as a landplane, which was regarded by Cobham as being more suitable for Australia's predominantly dry land mass. In an even greater demonstration of growing Australian airmindedness, on their arrival at Essendon airport in Melbourne on 15 August 1926, 150,000 enthusiastic supporters swarmed across the grassy fields to greet them, saluting Cobham's courageous flight. It is obvious that Australians recognised the importance of this journey for Australian aviation. According to Cobham, it also showed that people understood the part that aviation could play in the Empire (Cobham, 1926).

After maintenance on his Armstrong-Siddeley engine had been carried out at Point Cook, Cobham and his crew – Ward and Capel, the Armstrong-Siddeley representative who joined the flight in Melbourne – departed on 29 August for Adelaide and Darwin, where the floats were refitted to the DH 50J. Cobham's 26,703 miles round trip to Australia was completed when he alighted on the Thames river adjacent to the House of Commons on 1 October, thus becoming the first pilot to make a return flight from England to Australia. That airmindedness was also firmly established in the minds of the English was clear when '[o]ver 1,000,000 people lined the embankments and bridges of the River Thames to greet him' (RAF Museum, 2018). The significance of this pioneering flight was recognised by the British Government, which subsequently awarded Cobham a knighthood, Ward the AFC, and Capel an MBE (Cobham, 1926).

I readily acknowledge that Cobham's decision to select a floatplane over a landplane could be interpreted as being contentious in that the majority of the flight was over land and doubtless landing places might have been found.<sup>7</sup> While Cobham provides his reasoning in relation to the selection of a floatplane, that rationale disregards the fact that the aircraft could also be reconfigured as a landplane. Although this transition would be deemed impractical as a long-term proposition, it foreshadowed a path for the emergence of airmail in the practices of EAMS. Cobham's ability to choose an aircraft that could fulfil the dual role of a seaplane

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<sup>7</sup> I suspect that the choice of type of plane was influenced by the fact that the flight was indirectly funded by Imperial Airways which, as we have noted, had a policy preference for seaplanes. The relationship with IA probably also impacted on the choice of the most direct route – over both sea and land – in order to highlight a shorter flight time.

and a landplane suggests that his research for the journey and his aeronautical knowledge were finely honed. This aspect is reflected in the very successful culmination of the flight, succinctly described by the then Prime Minister of Australia, Stanley M. Bruce:

It was apparent, too, that the success of the flight against adverse conditions of every kind was not only evidence of the airman's personal courage, but also convincing proof that aerial communication between Britain and Australia throughout the year was perfectly feasible, given the requisite preparation. (Cobham, 1926, Foreword)

The British Government had long favoured an air route to its farthest dominions (Higham, 1960), and Cobham's successful return flight provided the foundations for this imperial imperative.

### *Moving Offshore*

The RAAF, which remained in its formative years, was intent on developing a strategy for the defence of the Australian mainland. In the process, the RAAF supported survey and photographic flights, authorised by both federal and state agencies, with the objective of expanding Australia's air and sea navigation. Foremost in the thoughts of military strategists of the time was the potential for an invasion from the north of the continent, foreshadowed by the ominous development of Japanese military forces. The Australian defence forces had limited tactical knowledge of this region however, and therefore embarked on an exploratory flight of Papua New Guinea and the Solomon Islands in order to address this deficiency. The aircraft chosen for the flight was a De Havilland DH50, an aircraft similar to that chosen by Alan Cobham on his record-breaking flight to Australia some three months earlier (Williams, 1977). This aircraft also reflected a further evolution of the seaplane, in that it was configured with all metal floats that were a substantial improvement on the wooden floats (prone to leakage) fitted to the Fairey seaplanes.

Group Captain Richard Williams, RAAF Chief of Air Staff and a strong proponent of the argument regarding the potential for invasion from the north, reflected that:

I felt that I must make myself acquainted with Papua, New Guinea and the Solomon Islands. In seeking the Ministers' approval to visit that area by seaplane I stated the object to be 'to gain knowledge of the geography and flying conditions in the Islands of the Pacific adjacent to Australia which owing to the rapid development of aircraft are fast becoming within range of the mainland of the Australian continent. (Williams, 1977. p. 165)

Group Captain Williams, Flight Lieutenant Ivor McIntyre, and Flight Sergeant Les Trist departed in a DH 50A floatplane A8-1 on 25 September 1926. The aircraft was the first RAAF

aircraft to be painted with the lettering 'Royal Australian Air Force'. It was also 'the first time an Australian-based aircraft flew beyond Australian territory' (Campbell-Wright, 2014, p.95).

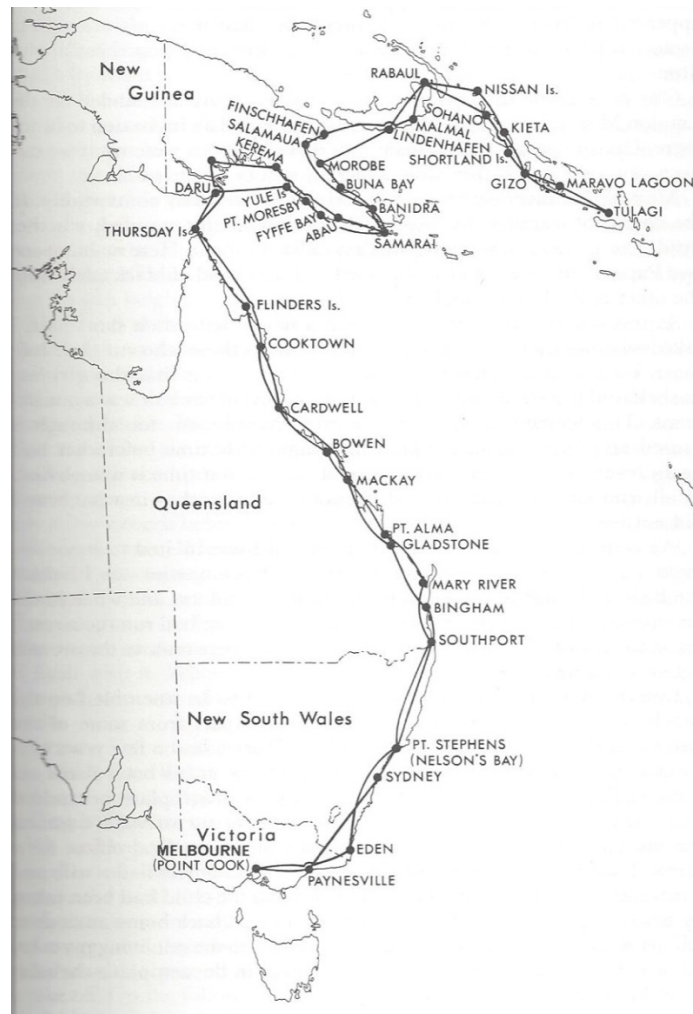


Figure 8: The Pacific Islands Flight of Williams, McIntyre and Trist, 1926

Source: Williams, Richard (1977), *These Are Facts* p.167.

The flight was sanctioned by the Australian Government with the stated principal purpose being to 'gain a knowledge of the geography of the islands in the Pacific adjacent to Australia ... required for Australian air defence purposes (Wilson, 2012, p.24). The latter part of this public statement reflected an intentionally 'diplomatic approach' to the original request by Williams.

The aviators and their DH 50A returned on 7 December 1926, having flown 10,000 miles (Figure 8) on a successful survey of the South West Pacific. This flight encountered a vast variety of meteorological conditions, including the tropical 'wet season', and was challenged by the restrictive conditions inherent in the operation of seaplanes. Despite a

mistake in the distance travelled, the Prime Minister's pleasure was evident in a cable from Bruce to Williams:

Congratulations on splendid achievement in your flight of nine thousand miles. You have demonstrated the wonderful possibilities of aviation not only in linking Australia more closely with outlying portions of the Empire in Pacific but also in the defence of Australia and outlying possessions. (Williams, 1977, p. 173)

### *Changing Mindset*

This flight around neighbouring Pacific 'territories' represented a milestone in the frontiers of aviation in Australasia. Facilities for the operation of landplanes were severely limited in the region that the flight surveyed, and the ability of the De Havilland aircraft to alight on the sea removed many of these constraints. There had been considerable debate as to the relative merits of seaplanes over landplanes. Williams encountered many difficulties with his survey flight, and on his return to Melbourne was of the view 'that seaplanes were properly employed only where landing places for landplanes were not available' (Williams, 1977, p.173). Williams' views arguably marked the decline in the seaplane's popularity, and this changing mindset was axiomatic to the future choice of aircraft types for RAAF service.

The significance of the aforementioned observation by the then RAAF Chief of Air Staff highlights his perspective that the future of aviation should not be confined to seaplanes – indeed, should only incorporate them as conditions rendered appropriate. This rationale met with resistance since it contradicted the prevailing consensus within the Navy. In 1927, the Commonwealth Government responded to general press criticism regarding its lack of defence expenditure. It requested a review of the RAAF by a senior RAF official and Air Marshall Sir John Salmond, Air Officer Commanding the Air Defences of Great Britain, was appointed to the role. Williams welcomed the review and, in an attempt to add weight to his burgeoning argument against the continuing reliance on the use of seaplanes by the services, listed the following concerns for Salmond's consideration:

1. The flying boat is an aeroplane – not a sea going vessel.
2. It cannot live in the open sea and therefore must have sheltered water from which to operate.
3. That shelter can be provided only by land, consequently these aircraft are really operating from land.
4. Given engines of a certain horsepower a designer can produce a much more efficient landplane than seaplane.



5. Once a landplane alights its crew and passengers can get out, by their own efforts, and the aircraft can be put into a shed or pegged down against storms.
6. Once a seaplane alights on water special provision – usually motor boats and the like – must be made to get the crew and passengers ashore, and the aircraft swinging at an anchor and exposed to wind and tide must be constantly watched. In other words, once a seaplane alights trouble starts unless it is brought ashore.
7. Because the flying boat cannot live in open seas it is being built only as a multi- engine craft, primarily to enable it to get back to land in case of one engine failing.
8. A multi-engined landplane could do the work faster and more efficiently.
9. The only place where flying boats are justified is where landing places for aeroplanes are not available and so far as Australia is concerned at the present time, that condition exists only in the islands (Williams, 1977, p. 182 -183).

Air Marshal Salmond's final report highlighted multiple deficiencies in the RAAF, apportioning much of the responsibility for these to a lack of sufficient expenditure by the Australian Government. Further, Williams' carefully reasoned argument, based on his recent experience, was to no avail. Salmond recommended that seaplane slipway bases be established at Albany in Western Australia, Darwin, Brisbane, Point Cook and Lake Macquarie in New South Wales ('Air Force', *The Sydney Morning Herald*, October 8 1928, p.11).

### *The Great Cruise*

Air mobility had become the new mantra of the UK's defence planners. In response to a review by the Committee of Imperial Defence, Air Committee, the Royal Air Force embarked on the most ambitious flight of its short history. On 17 October 1927, four RAF Supermarine Southampton Mk II twin-engine flying seaplanes departed Cattewater, Plymouth on a voyage that came to be known as the 'Great Cruise' ('Flying Boat Cruise', *The Daily News*, Perth, 1 June 1928, p. 7). The journey was to proceed via Asia and Australia with Singapore as the final destination, where it was anticipated that the RAF would establish a base (see Figure 9 for route map). In the words of Group Captain H.M. Cave-Brown-Cave, Commander of the flight:

The cruise is to be undertaken with the object of gaining experience in the problems involved when flying boats carried out an extended independent cruise. It is also hoped to gain experience of the problems involved in the reinforcing of points on the imperial routes with aircraft drawn from England or other parts of the Empire. In no sense is the cruise to be regarded as a "stunt", and no attempt will be made to cover the route in "record" time (Spooner, 1927, p. 732).

The flight epitomised imperial air strategy at the time, seeking to demonstrate the feasibility of future imperial routes. After a lengthy stay in Australian waters the four machines arrived in Singapore in December 1928, having covered 27,000 miles in 14 months without a major incident and thereby completing the RAF's first long distance formation flight (Figure 8.). In the process, it 'demonstrated the flying-boat's ability to operate independently of fixed bases over lengthy periods' (Cruddas, 2006, p. 206).

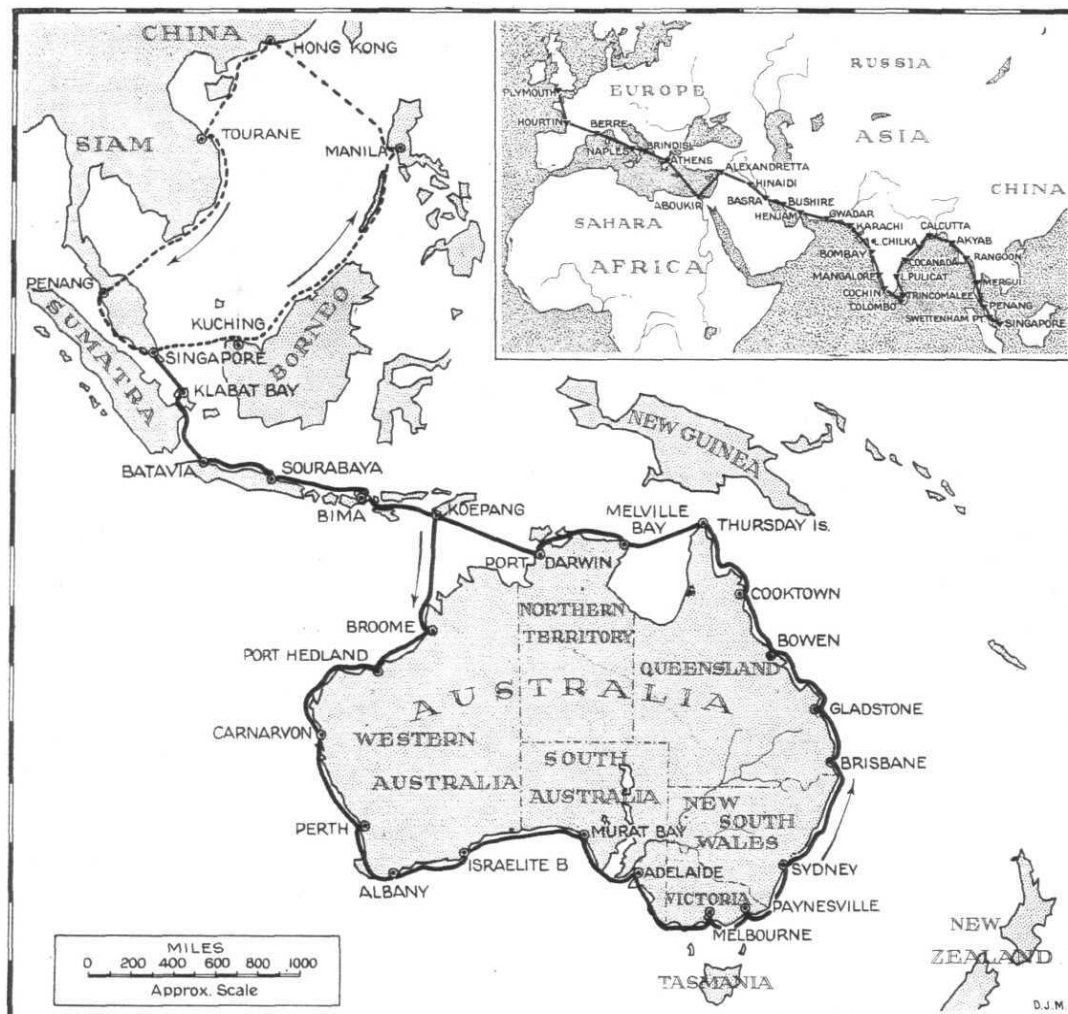


Figure 9: The Royal Air Force Flying Boat Cruise route map

Map shows the route taken during the Australian section of the Far East Flight, the side visit to Hong Kong, and (insert) the journey from England. Source: 'The Royal Air Force Flying-Boat Cruise. Log of the Far East Flight; Singapore – Australia – Singapore Section'. *Flight*, 4, XXI, p. 63.

In anticipation of the Far East flight's arrival in Australia, the Commonwealth Government ordered two ex-RAF Supermarine Southampton Mk I in June 1927. The intention was that the two aircraft would work in co-operation with the 'Great Cruise', and subsequently form the nucleus of a Coastal Reconnaissance Flight to be based at Point Cook. The primary difference between the RAAF Mk I and the RAF Mk II models was that the former had a double

thickness wooden hull and the latter had a single thickness duralumin hull. This resulted in a weight saving of approximately 900 pounds, which translated into an increased flight range of 200 miles.

One of these two Supermarine Southamptons, S1158, was dispatched to welcome the arriving RAF Far East flight but was overturned by a sudden gust of wind at a mooring on Adelaide's Torrens River. The crewmember on board at that time was not injured, however the partially submerged and upside-down aircraft presented as an inglorious welcome to the visiting flight on their arrival. Subsequently salvaged, S1158 returned to Melbourne and was eventually re-established in RAAF service as A 11-1, providing many years of operational use (Crick and Cowan, 2013). The two Supermarines continued to perform admirably for the RAAF in instructional, reconnaissance, and search and rescue roles, with one remaining in service with the Seaplane Training Flight until 1940 (Australian War Memorial, 2012).

### *The Seagull V, alias The Walrus*

In 1929, while Australia was wrestling with the onset of the Great Depression, the RAAF was engaged in the process of finding a replacement for their ageing Supermarine Seagull III aircraft. The harsh Australian tropical and sub-tropical conditions had taken their toll on these predominantly all-wooden aircraft and the new specifications called for a catapult-launched amphibious aircraft. It was to be of all-metal construction and 'able to carry a full military load, including bombs and with improved maintenance and performance, especially in tropical conditions' (Gretton, 2002, p. 1).

The concept of a catapult-launched aircraft from warships had been conceived in 1925 when the RAAF was informed that it was to provide support aircraft and crew for the RAN's *Albatross*. Specifications were drafted for a machine, however at that time they were unable to attract an aircraft manufacturer suitably interested in the project. That situation had altered substantially by late 1931, and as a private venture the Supermarine Aviation Works Ltd in the UK had produced a design with specifications corresponding to Australia's requirements. The Australian Government thus confirmed an order for 24 Seagull V aircraft in August 1934 and the first aircraft was delivered to HMAS *Australia* on 9 September 1935 (Gretton, 2002).

The chief designer of the Seagull V was R. J. Mitchell, designer of the Spitfire, who was at that time also a director of Vickers Supermarine. During the initial production of the aircraft for the RAAF, the British Air Ministry also placed an order for 12 aircraft, and at this stage the name was officially changed from Seagull V to Walrus. A total of 740 Walruses were manufactured by both the Supermarine Aviation Works Ltd and Saunders-Roe Ltd,

encompassing three variants, the Seagull V, Walrus 1 and Walrus 11 (Sturtivant and Burrow, 1995).

The principal role of these aircraft was intended to be air and sea rescue and reconnaissance, however over time their versatility was recognised. As a result, a further 37 Walruses were delivered to the RAAF by the end of World War II. The Walrus, affectionately known to aircrew as the 'Shagbat', was frequently 'described as one of the sturdiest aircraft ever built' (RAAF Museum, 2012, p.1).



Figure 10: Supermarine Seagull MK V, HD874m at RAAF Point Cook Museum

Source: Author's Collection.

The Walrus was designed to be catapult-launched from naval cruisers with a full military load and at the completion of its flight, hoist retrieved in open seas. Despite its sturdiness, this mode of operations made it relatively prone to accidents and incidents (Crick and Barr, 2015). However, as an aircraft type common to Allied forces the Walrus was responsible for rescuing over 7,000 airmen and seamen: its higher than normal attrition rate did not prevent it from being acknowledged as having provided particularly distinguished service throughout World War II (Gretton, 2002).

## *Conclusion*

Australia was ideally suited to the development of air travel by flying boat or floatplanes, in particular in the early days of aviation, as the majority of its population was domiciled in coastal environments. The RAAF, in its infancy, confirmed this notion by undertaking substantial regional and coastal exploratory flights in floatplanes. These pioneering flights established the potential and practicality that air travel could bring to remote and geographically isolated regions of Australia and its near neighbours. However, it became equally clear that land planes would be essential for non-coastal regions within Australia and other countries.

Entrepreneurial aviators returning from World War I realised that air services supporting airmail deliveries would be a very welcome addition to remote communities. Comparable operations had been successfully implemented in Europe with relevant government support, and it was anticipated that would be reflected in Australia. Q.A.N.T.A.S was formed on this basis in 1920 and, as the contemporary Qantas, it remains the second oldest continuously operating airline in the world, a flag carrier of which Australia can justifiably be proud.

European nations used aviation for nationalistic exercises in propaganda. They conducted a series of record-breaking flights to Australia using both flying boats and float planes, in the process demonstrating that Australia's isolation from the United Kingdom and Europe had shifted decisively. Individually, these flights were greeted with acclaim by the Australian public, fuelling their expectation that future endeavours could be carried out on a regular or scheduled basis. Collectively, they provided an expanding trove of knowledge of flying boat operations in particular and aviation in general.

In Australia, prior to World War II, flying boats and floatplanes became synonymous with flight. With a lack of land aerodromes and an abundance of coastal waterways, it was logical that any progress in aviation would initially follow this path. Increasingly however, there were contrary opinions being expressed by experienced professionals as to whether this was the preferable path to pursue. Australia's needs-based desire to embrace the new technology of aviation in various forms involved significant effort and commitment, but ultimately remained limited by its dependence on the UK, as one of its most distant dominions.

## Chapter 4: The Imperial Goal

### *Imperial Airways and the Empire Airways Mail Scheme to Australia.*

Imperial Airways was a consortium of airlines, which amalgamated at the behest of the British Government in 1924 with 'the stated aim of ... [being] the key factor in linking up Britain's worldwide Empire' (Oliver, 1999, p. 37). The government involvement is of historical importance, as it underscored an attempt by the British Air Ministry to gain the advantage in international civil aviation over rival European and American interests. The four airlines concerned (Daimler Airways, Handley Page Transport, Instone Airline and British Marine Air Navigation) brought their own relative merits to the group, with the intention of creating a monopoly and expanding the interests of British civil aviation.

The joint airline was privately financed, but subsidised by the British Government. It was this government influence that dictated a requirement that the airline be crewed by British pilots operating only British aircraft. Imperial Airways had been operating for ten years by 1934, including a newly established weekly service to Australia, and on 20 December 1934 the British government approved the Empire Air Mail Scheme (EAMS):

Sir Philip Sassoon, Parliamentary Under-Secretary of State for Air, announced that from 1937, Imperial Airways would carry all first-class mail for the Empire without surcharge, the Government having agreed to subsidize first-class airmail and pay Imperial Airways an economic rate for its carriage. (Sims, 2000, p. 24)

EAMS was conceived in 1931 by Mr. S. A. Dismore, the then Company Secretary of Imperial Airways, in response to stagnation within the airline. The concept involved transporting first-class mail to all parts of the British Empire by air, and at a financial rate only marginally more expensive than surface transport and substantially quicker. Initially the air journey to Australia took twelve and a half days, in contrast to an ocean liner that took 30 days (Sims, 2000). As mentioned earlier, Sassoon expressed a preference for an improved Kent Class flying boat for the EAMS. According to Cassidy, '[t]he primary function of the Empire boats was to carry EAMS and Government mail. Payload not required for mail was available for freight and passengers' (Cassidy, 1996, p.173). Essentially, the British Government proposed to provide a subsidy for the development of intercontinental air travel initially financed by airmail, replicating a process that had been implemented by governments worldwide.

The British aircraft manufacturer Short Brothers (usually called Shorts) was aware of the Air Ministry's requirement for an improved version of the Kent-class flying boat and had

been developing plans for a four-engine flying boat for the RAF with similar specifications. Imperial Airways approved the design of the Short S23 C-class (Figure 12.) in January 1935, with an initial order for fourteen aircraft, the first of which was to be delivered in April 1936. As the public acceptance of air travel was gathering momentum, so too was the demand. As a result, Imperial Airways increased this order to 28 aircraft in September 1935. This was the most significant order of aircraft that Imperial Airways had ever made and was justified by Major H. G. Brackley, Superintendent of Imperial Airways, who 'extolled the boats' capacious hull and the ability to operate from any sheltered piece of water along the Empire Route' (Sims, 2000, p. 25).

Imperial Airlines' principal rival airline, the Dutch-owned Koninklijke Luchtvaart Maatschappij (KLM), had concurrently established passenger and air mail services operating from Europe to Batavia in the Dutch East Indies, and was seeking approval for further eastward expansion to Australia. KLM had initially employed Fokker F.12 landplanes and was about to introduce the latest American technology in the form of Douglas DC 2 transport aircraft. With a cruising speed in the order of 175 mph, this was substantially faster than aircraft that had previously operated on comparable routes. KLM had won the London to Melbourne air race in its DC 2 PH-AJU *Uiver* in 1934, and a subsequent report in the *London Morning Post* on 24 October, suggested that 'America now has standard commercial aeroplanes with a higher top speed than the fastest aeroplane in regular service in any squadron in the whole of the Royal Air Force' (Holden, 2002, p. 71).

In comparison with the KLM DC-2, the Shorts S23 cruising speeds were planned to average 150 mph, which clearly placed the potential use of flying boats at a distinct disadvantage over the newer American landplanes. This reduction in speed was to be one of the first of the major compromises within the scheme, with Lord Londonderry, the Secretary of State for Air, justifying the choice by pointing to the decision to prioritise comfort and capacity over speed (Ewer, 2007).

### *Austerity Bites*

By the mid-1930s, the world was firmly in the grip of the Great Depression and visits to Australia from international flying boats were constrained with only a few exceptions. The first occurred in September 1934 when the RAF dispatched three Short S.8/8 Rangoon flying boats to Australia from 203 Squadron in Basra Iraq, to celebrate Melbourne's centenary. These three-engined biplane flying boats carried a crew of seven and were the largest metal-hulled machines then seen in Australia. They were a military variant of the Short S 8 Calcutta, which at that time was being operated by Imperial Airways between the United Kingdom (UK)

and India. As Jones recounts, '[t]hroughout their flight the three flying boats maintained their planned timetable, arriving at each port of call on the day originally scheduled. It had been a creditable performance' (Jones, 2002, p.16).

It was in this context that the Flying Boat Era became inevitable. Imperial Airways had operated a combination of landplanes and flying boats as far as Singapore prior to 1936, and Qantas Empire Airways (QEA) continued the service through to Sydney with landplanes. It was envisaged that the new Short C Class aircraft would continue to Sydney, replacing the smaller and less efficient DH 86 aircraft used by QEA. The Australian Government had negotiated the Singapore to Sydney rights for QEA and was strongly opposed to the use of flying boats, wishing instead to continue with landplanes, given that a route structure and ground facilities had already been established (Sims, 2000).

A survey flight under the leadership of Major Brackley of Imperial Airways departed Singapore on 7 May 1936 in a Short Singapore III flying boat (Figure 11.) of 205 Squadron RAF (Fysh, 1968) to assess suitable landing points for the proposed journey through to Sydney. Hudson Fysh accompanied the flight, representing QEA, and experts from both the RAAF and the Civil Aviation Board joined it in Darwin.



Figure 11: Short *Singapore III* Flying Boat, similar to those operated by 205 Squadron

Source: Imperial War Museum. Daventry, B J (Mr), Royal Air Force official photographer, <http://media.iwm.org.uk/iwm/mediaLib//22/media-22879/large.jpg>

In these early years of aviation, the choice of airline routes was largely dictated by aircraft performance, and this flight continued from Darwin across northern Australia stopping



at Roper River, Mornington Island, Karumba on the Cape York Peninsula, then with overnight stops at Bowen, Gladstone, and Brisbane. Despite his reservations about the overall performance of flying boats, Hudson Fysh declared on arrival in Sydney that 'a pioneering trip had been completed with full satisfaction over more or less uncharted waters' (Sims, 2000, p. 47).

In a perceived attempt to reinforce the British Government's strong disposition towards the acceptance of flying boats, the RAF furnished another patriotic and propagandist flight to celebrate the sesquicentenary in January 1938 of the First Fleet's arrival in Sydney. This flight was reminiscent of the Far East Flight, in that a formation of five *Saro-London*'s two-engine biplane flying boats departed Plymouth on 1 December 1937. They had been fitted with external long-range fuel tanks that had doubled their range to 2,600 miles and, after battling difficult monsoonal weather, they arrived in Brisbane on 21 January 1938. The RAF had once again maintained its schedule and departed for Sydney on 25 January, where they remained throughout the anniversary. The flight's successful arrival return in May 1938, after travelling 29,800 miles, emphasised 'again the reliability and safety of flying boats for long distance travel' (Jones, 2002, p. 18).

The involvement of the Australian Government with EAMS was crucial to its success. The plan was extremely expensive, and the British Government required subsidies from the colonies and dominions that were to benefit from it, namely those in Australia, India and Africa. The Australian Government was particularly concerned about the use of flying boats due to the costs associated with their infrastructure, and therefore delayed the implementation of the scheme until a suitable financial arrangement had been agreed (Ewer, 2007). In defence of the British Government's decision, the Imperial Airways General Manager said that EAMS 'is unquestionably the greatest step forward in postal development since the introduction of the penny-post and will give immense benefit to the empire and promote its consolidation and unity' (Sims, 2000, p. 81). The British Government's decision prevailed, and in the process dismissed as farcical the fundamental technical problems that had been identified by both the head of Australian Civil Aviation and QEA. Air Marshall Sir Richard Williams, head of the RAAF, was also highly critical of the flying boats and there were suggestions that these aircraft 'did not fit in with the current defence plan' (Fysh, 1977, p. 47). The continuing argument on the merits of flying boats over landplanes was yet to manifest itself fully, as the tensions between the needs of Australian defence and imperial consolidation continued to grow. It is clear, however, that Australia's growing sense of its own needs, both military and civilian, were key to the unease with British imperial policy among various key Australian aviation personnel.

## *The Short S23 to Australia*

Construction of the S23 (Figure 12.) commenced at Rochester in 1935, and the maiden flight took place on the afternoon of 3 July 1936, lasting 14 minutes. Subsequent test flights of *Canopus*, the first of the C class boats, occurred over the following three months and the aircraft was officially handed over to Imperial Airways on 20 October 1936. As a result of its trial flights, the aircraft was deemed a total success by the Ministry of Aviation Experimental Establishments (MAEE) which observed that 'pundits had been astonished by the take-off performance' (Sims, 2000, p.37). Although designated S23 by Shorts, they were generically termed 'Empire Flying Boats' and colloquially known as 'C Class' flying boats, as all the aircraft received names starting with the letter C.

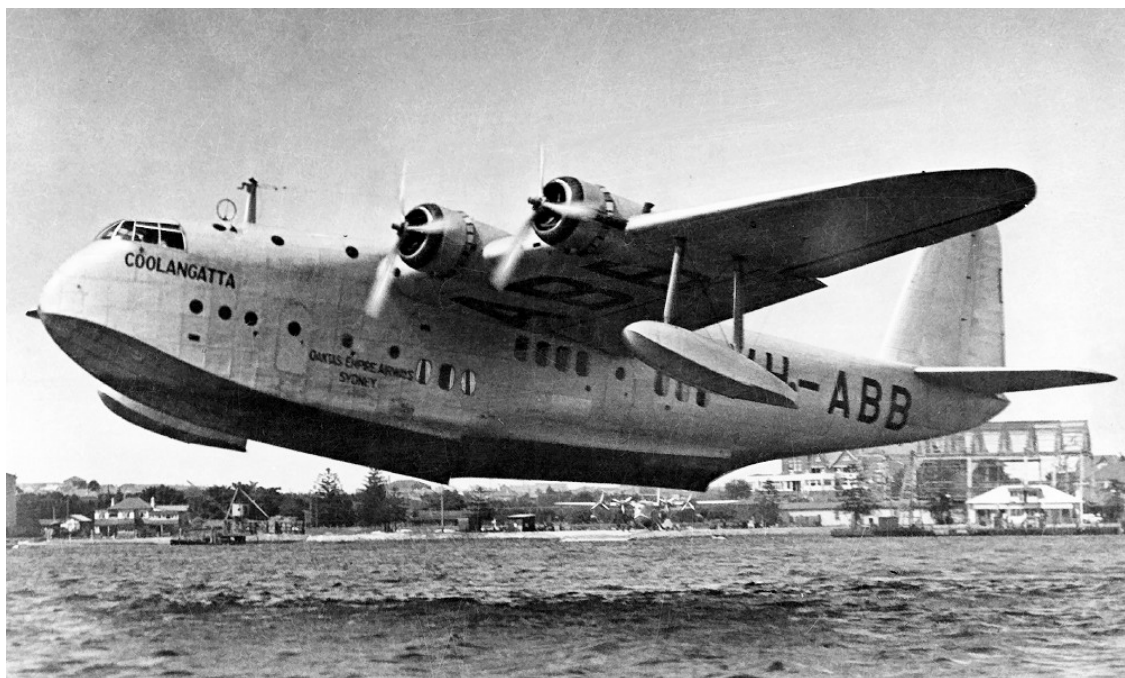


Figure 12: 'Empire Flying Boat' or 'C Class' VH-ABB, Qantas Empire Airways' *Coolangatta* in the standard livery at Rose Bay, date unknown

Source: Qantas Heritage Collection; used with permission of David Crotty (Curator); Copyright Image 2545-355

The introduction of the Empire Flying Boats brought unparalleled changes to the aviation world, and they were regarded as being at the forefront of aviation technology. These all-metal aircraft were powered by four Bristol Pegasus 920hp radial engines, credited with maximum speeds of up to 200 mph and recognised as being one of the fastest flying boats in the world (Sims, 2007). They were also one of the first aircraft to incorporate a Sperry autopilot and were 'on track to transform long distance travel around the British Empire in speed, comfort and reliability' (Jones, 2007, p. 20). The first scheduled mail service to Australia had commenced on 8 December 1934, with QEA contracted to fly the sector from Singapore to

Sydney using a DH86 aircraft. The following April saw the introduction of a combined passenger and mail service, which took twelve and one-half days to cover the 13,000 miles journey. It was anticipated that the Empire Flying Boats, operating at significantly higher cruise speeds than their predecessors, would reduce this time to nine and one-half days (Sims, 2007).

In September 1937, the Australian Federal Government announced that the planned commencement date for EAMS would be mid-1938. To support this introduction, the first Short C Class flying boat arrived in Australia on a proving flight on 1 December 1937. The Imperial Airways C Class flying boat *Centaurus* was under the command of Captain J. W. Burgess from London to Singapore – he had previously brought one of the RAF Rangoons to Australia. The principal aim of this particular flight was ‘proving the practicalities of operating Empire Flying Boats over the complete air route to Australia’ (Jones, 2007, p. 20). The Singapore to Sydney sector was operated by QEA and under the command of Flight Superintendent Captain Lester Brain, arriving in Sydney on Christmas Eve 1937.<sup>8</sup>



Figure 13: The Empire Flying Boat route structure

The red line indicates the original EAMS route and the Green line represents the Horseshoe Route.  
Source: Grant, Peter, *The Airborne Sinews of Empire*, 2010.

<sup>8</sup> EAMS was subsequently renamed the Empire Air Mail Programme (EAMP) and the Programme's inaugural flight departed Southampton for South and East Africa in the Shorts S23 C-class 'Centurion' on 29 June 1937 (Cassidy, 2013, p. 24). Most aviation historians and government archives continue to reference articles related to the programme's original designation of EAMS, either through lack of awareness or simply because they dismiss the name EAMP.

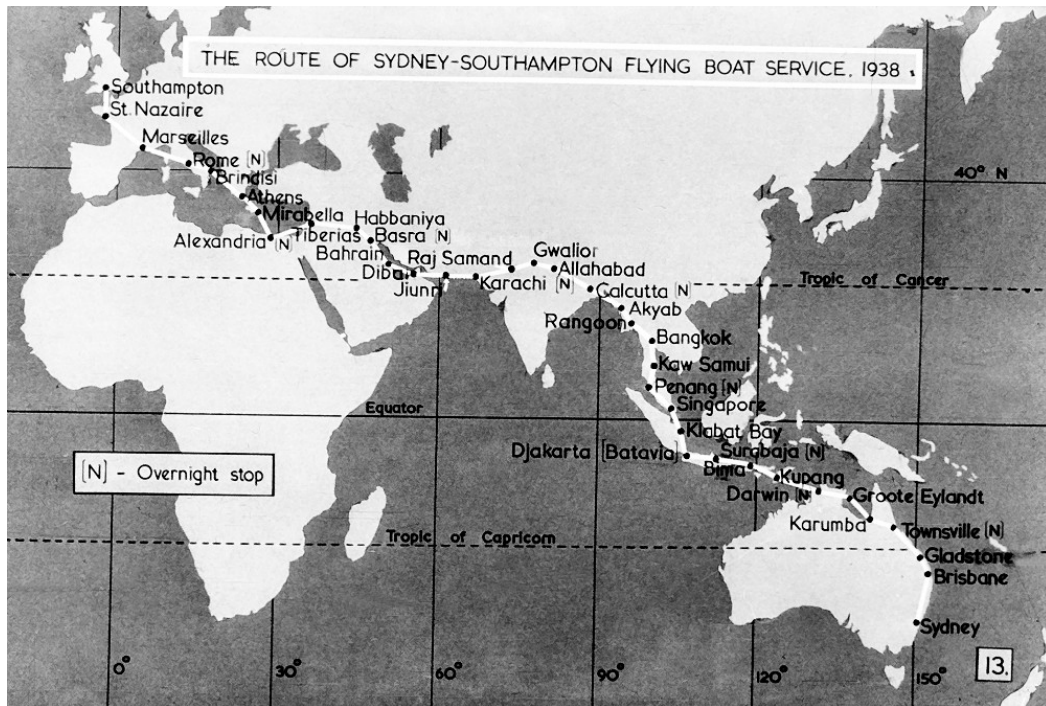


Figure 14: Qantas Empire Airways – route map of the journey by Short S23 Empire Flying Boat, Sydney to Southampton, 1938

Source: R.N. Smith Collection Image 2545-224; copyright expired.



Figure 15: S23 Empire Flying Boat *Centaurus*, Evans Bay, Wellington, New Zealand

Source: Charles, Sydney (1888-1972); photographs of New Zealand. Ref: 1/2-048518-G. Alexander Turnbull Library, Wellington, New Zealand. /records/23247410

The *Centaurus* continued across the Tasman for a two-week visit to New Zealand on Monday 27 December (see Figure 15 above), returning to Sydney to participate in the sesquicentenary celebrations alongside the visiting RAF Far East Flight of Saro-Londons. The promotional flight returned to England in late February 1938. It was noted that *Centaurus* 'had performed magnificently throughout its round journey of 32,000 miles, restoring faith in British aircraft design' (Jones, 2007, p. 21).

### *QEA, the C Class and EAMS*

After much debate by the respective governments of the UK and Australia, and relevant input from their national airlines, QEA agreed to an order of six of the original batch of S23 Empire Flying Boats in early 1937 (Fysh, 1968). The six aircraft would maintain the tradition of the C Class flying boats and be called respectively *Coogee*, *Corio*, *Coorong*, *Carpentaria*, *Coolangatta* and *Cooee* (Sims, 2000). By 1938 the partnership of Imperial Airways and QEA had operated successfully for four years, and QEA was shortly to enter a new realm of co-operation with the delivery of its first C Class flying boat. QEA pilots had been training in the UK with Imperial Airways and one of their most respected and experienced captains, 'Scotty' Allan, commanded their first flight. *Coolangatta* departed Southampton on 18 March 1938 and arrived in Brisbane, then the headquarters of QEA, in early April. *Cooee* the second of the C Class boats was commanded by Captain Lynch-Blosse, who had been seconded from Imperial Airways, and arrived shortly after *Coolangatta*. Both flying boats were used for crew training in Brisbane (Fysh, 1968).

Although the Short S23 aircraft were credited with a maximum speed of 200 miles per hour, their true cruising speed was an average of 150 miles per hour with a range of 760 miles (Cassidy, 1996). In explaining the limited range, Fysh stated that:

The modest range was designed to enable the carriage of the largest payload permissible between the short refuelling stages on the Empire route. The ranges of the Empire boats built for the North Atlantic reached 2,500 miles, and of course they carried a smaller payload as a result of all the extra fuel, which had to be lifted. (Fysh, 1968, p. 63)

The Empire Flying Boats were regarded as having a very advanced design for their time, with a deep aerodynamic hull that was constructed using the stressed skin methodology, and including flaps, variable pitch propellers and cantilever wings. With promenade decks and the most luxurious saloons ever offered in a British-designed aircraft, flying boats introduced the concept of luxury to air travel. Compared to the Americans' Sikorsky S 40 and S42, Martin M-130, Boeing 314 Clipper flying boats, and the Germans' Dornier X, the Empire Flying Boats



presented the ultimate in comfort and were at the peak of sophistication in long distance air travel (Sims, 2000). Royal Air Force Marshall, Lord Tedder, described it as

...the most comfortable air journey I ever had. The ability to walk from one deck to another or to stand leaning on a handrail, looking down at the passing scene below, gave one an air of luxury not to be experienced in any modern aircraft (Knott, 2011, p.50).

I suggest that there was more than a degree of hyperbole attached to Lord Tedder's statement, since having spent some years operating comparable aircraft it seems to me that the experience described in his rhetoric was decidedly uncommon. However, Fysh also commented, somewhat less fulsomely, on the comfort factor, observing much later that '[o]f course the great attraction of the flying-boats was the unprecedented spaciousness which aircraft do not provide today' (Fysh, 1968, p. 71).

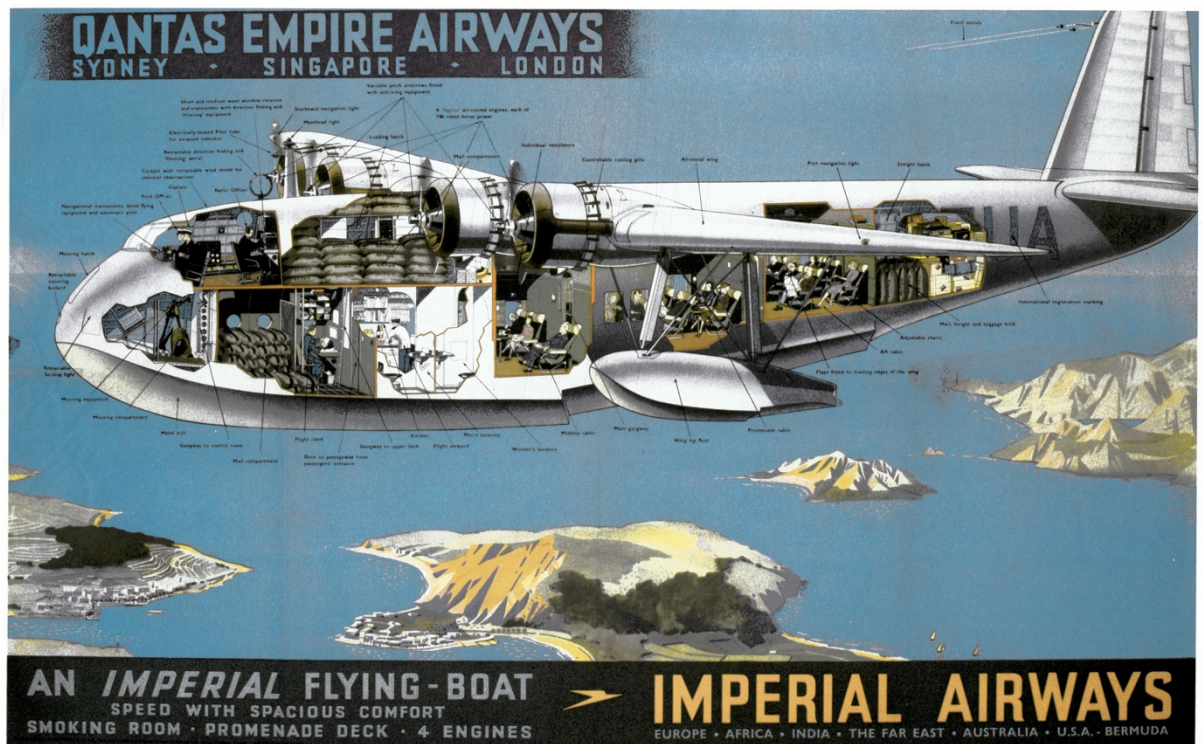


Figure 16: Imperial Airways C Class Flying Boat

Source: Qantas Heritage Museum, used with permission of David Crotty (Curator).

The enhanced level of comfort was due in part to the presence of a flight steward supervisor and a steward, the first for an Australian airline. Hot food was provided courtesy of innovative vacuum packs, along with a respectable wine list, as one of the primary attractions to sway passengers away from ship to air travel (Sims, 2000). The QEA C Class boats carried fifteen passengers in a first class configuration, and in addition to the stewards, it was crewed by a Captain, First Officer, and Radio Operator. The Short S23's total weight was initially 40,500

pounds with a variable payload of approximately 8,200 pounds (Fysh, 1968). In the later S30 and S33 models the total weight increased to 53,000 pounds (Cassidy, 1996).

After agreement was reached between QEA and the Australian government, and finally between the Australian and British governments, the first westbound flying boat service departed for the United Kingdom on 5 July 1938. The inaugural flight of the Empire Air Mail Scheme departed from Southampton approximately three weeks later on 28 July 1938, and the mail loaded onboard this flight had the previously unmatched weight of two and a half tons (Fysh, 1968). Under the command of Captain Lynch-Blosse, it carried a dispatch from his Majesty King George VI to the Acting-Governor General of Australia, Lord Huntingfield, stating that, '[a]n important stage in the development of communication between the peoples of the Empire will be completed tomorrow when the first flying-boat will leave this country for Australia under the Empire Air Mail Scheme' (Fysh, 1968, p. 68).

The increased mail capacity of the C Class resulted in a record 222 tons of Christmas mail being carried between the United Kingdom and Australia in the first season. 'In their first nine months from 4 August 1938 they carried substantially more mail than the DH 86 landplanes had carried in all their four years of operation' (Gunn, 1987, p. 2). In April 1935, the first-class air fare for the 12,754 miles journey to Australia was £195 sterling, however in 1938 the return air fare was reduced to a maximum of A£342, in order to attract sufficient passengers. The elapsed journey time had also been reduced from twelve and a half days to nine and a half days (Figure 17 below).

A year after commencement of EAMS in September 1939, the service had increased substantially and carried over 4,900 passengers and 426 tons of mail (Fysh, 1968). Australia had clearly reaped the benefits of EAMS. According to Ewer, '[t]he Empire Air Mail Scheme (EAMS) was Britain's most significant civil aviation initiative of the 1930s' (Ewer, 2007, p. 1).

In opposition to Imperial Airways, the Dutch received approval from the Australian Government to continue their service from Batavia to Sydney. KLM were operating their services to Batavia utilising DC 3 aircraft, and Koninklijke Nederlandsch-Indische Luchtvaart Maatschappij (KNILM) or Royal Dutch Indies Airways (KLM's Netherlands East Indies subsidiary) were now to continue through to Sydney flying Lockheed 14 aircraft. The inaugural KLM service departed Amsterdam on 28 June 1938 and its partner, KNILM arrived in Sydney on 5 July (Fysh, 1968). The distinct advantage to this particular competition was speed, with KLM/KNILM taking a full day less than the Imperial Airways/QEA consortium. The Dutch service meant that the travelling public now had a choice between the in-flight comfort of the flying boats, with their spacious cabins and first-class service, and the practical advantages of

land-based operations combined with reduced flight times. Figure 17 demonstrates how strongly Qantas Empire Airways stressed both comfort and a sense of speed in its advertising.



Figure 17: Qantas Empire Airways Advertisement, circa 1938

Source: Phil Vabre, Australia's Civil Aviation Historical Society.

However, with the arrival of the KLM/KNILM, another wedge was driven into Imperial's 'flying boat first' philosophy. Although there had been various ongoing management disagreements between the Imperial Airways and QEA partners in the consortium, Qantas remained firmly in support of Imperial's mandate to operate long distance flights using four-engine aircraft, albeit in the guise of flying boats. Fysh, while publicly acknowledging their attributes, was disdainful of the DC 2's and DC 3's capacity to operate the long 'empire' routes, describing them as, '...of course, only a twin engine type and primarily designed for service on the transcontinental routes of the U.S.' (Gunn, 1985, p. 188).

The EAMS and the C Class flying boats were not without their problems: accidents and continuing maintenance issues plagued the scheme from commencement, and the priority given to airmail meant that at peak mail times there were difficulties meeting the demand for passenger service. The EAMS agreement had originally been contracted to last fifteen years based on three services per week to the UK, however QEA retained an overriding clause that



allowed it to withdraw if it found the aircraft to be unsuitable (Fysh, 1968). Planning for the EAMS scheme had been poorly conceived by the Air Ministry, with the result that the service was over-subscribed with mail on numerous occasions (Ewer, 2007). In 1938, the overwhelming demand for Christmas mail required a total of forty-two services to be operated in and out of Rose Bay. To comply with the increased demand and the contractual requirement to prioritise airmail, twelve of the aircraft were stripped of their passenger accommodation to allow an additional half-ton of airmail to be carried on each service. As a consequence, many passengers were offloaded so that the contracted mail requirements could be maintained. Compounding this situation, flights southbound out of Kupang in Timor were required to carry more fuel due to the longer overwater stage to Darwin, reducing their total freight and mail capacity. This surplus mail inbound to Kupang, was then transported in DH 86 landplanes, onward to Australia. It was estimated that during this Christmas period alone, 240 tons of mail was dispatched on flying boats from Southampton to the dominions (Fysh, 1968).

In addition to these problems, by the end of June 1939, there had been nine major accidents resulting in the complete hull loss of the aircraft (Sims, 2000). Two of these accidents occurred during the Christmas rush of 1938, further restricting the ability of the programme to meet the demand. Major Mayo, the technical expert for Imperial Airways, had determined that the C Class was susceptible to damage due to a lightly constructed hull. A further technical analysis established that 'the flying boats fell short of contractual payload' (Ewer, 2007, p. 87). The problems besetting the Short C Class were attributed to both design and environment. In addition to the lightly constructed hulls, the limitations associated with the maintenance requirement of a 250 hours cycle on the Bristol Pegasus engines was highly restrictive (Cassidy, 2013). The salt and resulting corrosion to which flying boats were continuously subject contributed to extensive additional maintenance (Byrnes, 2000). These extra maintenance requirements were often further exacerbated by the flying boats being in a marine environment without the facilities normally associated with land planes, such as the protection provided by hangars to both aircraft and personnel.

Being exposed to the elements from both above and below resulted in some unique adaptations by the maintenance personnel. As the majority of maintenance had to be done with the aircraft on the water, including engine changes, the loss of equipment and tools overboard was initially a common occurrence. George Roberts, a senior engineer with QEA, described how '[t]he maintenance teams drilled holes in their tools and attached them to their belts with fishing lines. If a large part such as an engine cowling fell into the water, a diver would be brought in to find it' (Byrnes, 2000, p. 122). With diminishing aircraft numbers and the non-availability of replacement aircraft, EAMS was becoming an embarrassment for the

British. Government officials had by this time concluded that they were incorrect in their selection of flying boats and that British aviation needed to move forward with landplanes (Sims, 2000).

On the basis of poor operational performance and an inability to fulfil the regulated demand for airmail, EAMS could be viewed as unsuccessful. Furthermore, the failure of both of these objectives had their origins in the inappropriate choice of aircraft. In retrospect, the decision to proceed with flying boats rather than landplanes was based on political expediency and was an outcome of fundamentally unsound planning. On the other hand, Australia certainly benefitted substantially from the provision of inexpensive and relatively fast airmail for the first time. Passenger travel had also improved significantly, with the C Class flying boats providing an unsurpassed level of glamour and comfort. Most importantly, the requirement and provision of scheduled international air services to Australia had now been firmly established. The isolation of Australia as one of the British dominions most distant from the UK had been decisively reduced, with Rose Bay flying boat base making a major contribution to that.



Figure 18: Aerial view of Rose Bay Flying Boat Base, circa 1950

Source: Woollahra Municipal Council Library, with permission

## *Rose Bay: The Hub of Flying Boat Operations in Australasia*

Given that seaplane operations in Australia had originated on Sydney Harbour, it came as no surprise that Rose Bay was selected as the primary choice for a flying boat base and terminal. On his initial survey flight in 1937, Major Brackley of Imperial Airways had identified this wide expanse of protected waters as being an ideal alighting area for flying boats. The selection of Rose Bay over the only other feasible alternative, Botany Bay, was even more apparent when the additional costs of constructing a breakwater at the latter were included. Rose Bay also had the advantages of geographical location and population, its proximity to the city centre being ideal for the distribution of mail, and for the convenience of passengers. In any case, as Fysh observed:

Sydney stood as the natural point of entry when the day came for the start of trans-Tasman and trans-Pacific services. This would establish Sydney as the premier international airport of Australia, a position she still rightfully holds. (Fysh, 1968, p. 57)

There were public concerns about Rose Bay's selection as the base for airmail operations in Australasia. On 25 June 1937 the *Sydney Morning Herald* (*SMH*) published an article under the headline 'Rose Bay or Empire', alluding to concerns from the local community about the potential industrialisation of Rose Bay and detrimental effects to the harbour foreshore. The unattributed opinion piece was, however, strongly advocating the establishment of the base, suggesting that the proposed alternatives of Port Stephens, Lake Macquarie and Lake Illawarra were too distant from Sydney to be worthy of consideration. Dismissing local objections as 'idle and ignorant cavillings, we find that Rose Bay is at present the most suitable site for the air-mail base establishment and landing stage, with heavy repair shops and other necessities placed further up the harbour' (*SMH*, June 25 1937, p. 10). Nevertheless, prolonged discussions between concerned community groups and authorities resulted in a significant delay in the construction of the hangar but did not impede the building of a terminal for the embarkation and disembarkation of passengers and staff. Eventually, Commonwealth persuasion prevailed over state politics, and Rose Bay was confirmed as the principal flying boat base for operations within Australia.

The local residents had legitimate cause for concern, especially in terms of their scenic amenity, because when the very substantial aircraft hangar was finally completed at Rose Bay in October 1939, it physically dominated the harbour foreshore, as can be seen in Figure 18. This hangar was 200 feet long and 70 feet high and could accommodate two of the Short C Class flying boats side by side ('Flying Boat Hangar at Rose Bay', *SMH*, July 18 1939, p. 13). Its prominence emphasised its role as the central maintenance facility for flying boats in

Australia throughout the war years. Further industrialisation did not eventuate as feared. Instead, a more modest approach was achieved through the establishment of QEA's embryonic instrument overhaul workshop. This facility's reputation as a centre of excellence for the overhaul and repair of aircraft instruments was undisputed. As the demand for overhauling crucial aircraft instruments grew, including those from the armed forces, the facility moved to a converted bus depot in Double Bay in 1942. The relocation of the instrument overhaul workshop to these larger dedicated premises allowed the workforce of 30 technicians to expand to 187, including many women who were employed predominantly in instrument overhaul and instrument dial painting. By the end of World War II, the workshop had processed over 183,000 instruments, an exceptional accomplishment for a relatively small but innovative group of technicians (Byrne, 2000). As Fysh (1968) affirms, '[t]he shop earned a name for achieving a high standard of efficiency, and a QEA overhauled instrument was a hallmark' (p.101).

The initial negotiations with Imperial Airways called for the major maintenance of engines to be carried out in the UK. Potentially, this would have resulted in an elapsed period of four months in shipping the engines for repair and return to Australia. Fysh once again displayed his foresight, and based on his outback experiences, argued that the construction and development of an engine overhaul facility in Sydney was the preferred option. The ominous threat of World War II was doubtless a consideration in this decision.

This facility, alongside the instrument repair workshop, demonstrated a further financial commitment by Qantas to the evolution of the imperial flying boat strategy. Interestingly, in contrast to the construction of the Rose Bay hangar, the engine overhaul facility was finished at Mascot in approximately two months and opened in August 1939 (Fysh, 1968). This workshop continued with the ethos of 'the high standard of efficiency' stated by Fysh, highlighting what the author believes to be a new benchmark level that became the minimum standard for the next generation of professional engineers within Qantas Airways Ltd.



Figure 19: Rose Bay Seaplane Base in 2017

Source: Author's Collection.

### *Pioneering Survey*

Rose Bay flying boat base was to feature as the starting point for a number of record-breaking flights. One of the most important of these took place in 1939 when the Australian and UK Governments chartered *Guba-II*, a privately owned Consolidated PBY Catalina model 28-3 (Figure 19.) to undertake a survey flight from Port Headland on the west Australian coast across the Indian Ocean to Mombasa on the east coast of Africa. The primary objective of the flight was to survey 'a reserve air mail route' ('Flight of the Guba', *The Telegraph*, Brisbane, August 4 1939, p.7) for both defence and civilian aircraft, in the event that Japan should enter World War II as an aggressor and block the existing Empire route at Singapore. Having undergone maintenance at Rose Bay, the PBY departed Sydney on 3 June 1939 for Port Headland in Western Australia and arrived the following day, having covered 2,600 miles in 19 hours and 35 minutes ('Guba Lands at Port Hedland', *Northern Star*, Lismore, June 5 1939, p.7). In the process, it completed the first flight across Australia by a seaplane.

This survey flight occurred as part of a circumnavigation of the world by Richard Archbold, an American zoologist and philanthropist (*Round-the-World Flights*, 2012). Archbold generously agreed to a request by the Australian Commonwealth Government to participate in the survey, and to make his aircraft available. One of Australia's best-known aviators, Captain P. G. Taylor, joined the flight in Sydney as commander and navigator, and assumed responsibility for the organisational aspects of the journey. This included the planning to proceed in four stages as follows:

- Port Hedland to Cocos Islands, approximately 1000 miles;
- Cocos to Diego Garcia, approximately 1250 miles;
- Diego Garcia to the Seychelles Islands, 850 miles;
- Seychelles to Mombasa, 800 miles.



Figure 20: Catalina PBY *Guba-II* at Rose Bay

Source: 'Flying-Boat Guba's Crew For Ocean Flight', the Sydney Morning Herald, May 17 1939, p. 16.

Archbold elected to continue with his scientific investigations throughout the flight and Captain Taylor was tasked with determining the viability of establishing flying boat bases at the various staging points (Taylor, 1939). On the first stage of the journey from Port Headland, inclement weather *en route* to Cocos Island prevented Taylor from achieving a positive navigational fix and the flight diverted to Batavia (Jakarta). The following day a second attempt to land at Cocos Island was successful and the remainder of the journey progressed as scheduled.

Another significant historical aspect of this flight was that it was the first flight across the Indian Ocean, the penultimate of the world's oceans to be crossed. The foresight displayed by both Taylor and the Commonwealth Government in seeking out a secondary air route to Europe was amply rewarded during World War II, when Japan blocked the original Empire route. Taylor's professionalism was also evidenced by his recognition and selection of the very



latest in American aviation technology in the form of the Consolidated Catalina PBY aircraft, fully appreciating its structural and long-range endurance capabilities. The successful completion of this pioneering journey demonstrates once again that flying boats played a significant part in the ongoing development of aviation, highlighting their flexibility, and reflecting their ever-increasing value to the communications and transportation systems of Australia and the world.

### *Conclusion*

The arrival of the (comparatively) luxurious flying boats reduced Australia's isolation and, in the process, offered the nation a scheduled international airline service comparable to European standards. The United Kingdom, commonly regarded as 'the mother country', was intent on maintaining its strong contact with its dominions for commercial and strategic purposes, and to this end implemented the Empire Air Mail Scheme in conjunction with the reorganised Qantas Empire Airways.

The principal purpose of EAMS was ostensibly the delivery of airmail supplemented by the carriage of passengers, although far-sighted interests involved hoped-for monopoly control of air routes. This scheme resulted in consolidating the newly established scheduled airmail service between the UK and Australia, using the most luxurious airliners of their time, the Short S23 Flying Boat. The considerable appeal of a rapid long-distance airmail connection with the dominions, at an acceptable price to the general public, caught the architects of the scheme by surprise. The program was highly successful at its commencement, to the point that it was oversubscribed with subsidised airmail. It subsequently proved to be a financial burden to both the British and Australian Governments. After a short time in full commercial operation, the EAMS program was discontinued at the commencement of World War II. By this time, however, the commercial and psychological value of airmail and relatively comfortable long distance air passenger travel had been irreversibly established.

The demise of EAMS was part of the transformation of the aviation industry from a government-directed focus on imperial connectedness to an evolving response to Australian airmindedness based more pragmatically in Australia's interests. The advent of the Short S23 C Class Empire flying boats in Australia provided a foretaste of the development of the nation's aviation industry as among the world's specialist long haul carriers.

## Chapter 5: World War II

### *The Outbreak of War*

The outbreak of war on 3 September 1939 caused the suspension of EAMS, just 13 months after the inaugural flight to Australia. London enacted contingency plans for EAMS when the United Kingdom (UK) and its allies declared war on Germany, and the previous surcharge system was restored to limit the volume of mail and prioritise essential services. The schedule was reduced to two services per week in each direction, and preparations were begun at the recently completed Rose Bay hangar to modify two of the Imperial C Class boats to meet RAAF requirements (Fysh, 1968). The RAAF's logistics capability remained limited due to under-resourcing so these two Imperial C Class boats (see Figure 21) were requisitioned in exchange for the two Qantas flying boats, *Coorong* and *Corio*, which were placed on the British register.

Modified by Qantas maintenance personnel to incorporate three additional 220 gallon fuel tanks, the Imperials' luxurious internal accommodation was replaced by austere and practical wartime fittings. Bomb racks, capable of carrying either 250 or 500 pound bombs, were fitted beneath the wings and mounts for Lewis guns were installed either side of the rear freight compartment. The bow mooring hatch was replaced by a peculiar-looking but effective visual bombing cupola sufficiently spacious for an observer's head and shoulders (Sims, 2000, p. 208).



Figure 21: Modified QEA Empire C Class flying boat in RAAF livery as A18-10

Source: Hudson Fysh, W.H. (1968) *Qantas At War*, p. 85.



On completion of modifications and in RAAF livery, the aircraft were delivered to the newly formed No 11 Squadron RAAF and then dispatched to Port Moresby, New Guinea. Their task was reconnaissance and patrol in the northern waters of Australia, New Guinea and the Solomon Islands. These aircraft were initially crewed by Qantas pilots, engineers and supplementary staff, who were released from their civilian roles to take up RAAF reservist appointments (Fysh, 1968).

### *'Queen of the Boats': Sunderlands in the RAAF*

On 23 November 1933 British Air Ministry specification R.2/33 was issued to established flying boat manufacturers, calling for tenders for a 'Four Engined General Purpose Boat Seaplane' (Cassidy, 1996, p.42). Short Brothers of Rochester successfully secured the tender, and the specifications were subsequently subdivided between S23 for the Empire Class craft and S25/36 for the 'Military Boat', which became the Sunderland. The Sunderland's design and production took place alongside that of the Empire Class, albeit as a lower priority, given that Imperial Airways' 'original order for flying boats had stipulated a first flight by 30 April 1936' (Cassidy, 1996, p. 42). This 'lower priority' was turned to an advantage, as the S23 Empire or 'C Class' was essentially used as a benchmark for the ongoing design and manufacture of the Sunderland. Operational experience with the C Class resulted in design improvements, such as a reinforced, deeper hull profile along with increased range and improved performance, which were incorporated progressively into both newer C Class and the developing Sunderland aircraft. While the C Class clearly acted as an incidental prototype for the Sunderland, which benefitted greatly from that, Knott (2011) has also observed that the more effective design of the Sunderland and the additional time taken for its completion were both products of the fact that 'The Ministry was more pernicky and less plagued by urgency ... than Imperial Airways' (p.158).

As a result of the breakdown of talks at the World Disarmament Conference in Geneva in 1934, the RAF was charged with establishing forty-one new squadrons by March 1939. Six of these squadrons were to be equipped with flying boats, which created a need for thirty-six new craft. By the outbreak of war in September 1939, forty Sunderland Mk I flying boats had been delivered, including the nine aircraft of the RAAF's No 10 squadron (Cassidy, 1996). A cost comparison between the Empire boats and the Sunderlands is interesting and could be surprising. Based on Short Brothers' 1936 figure, a QEA Empire flying boat cost £48,830 to manufacture (although QEA had their boats valued at £55,288) while Shorts' 1938 figure for the manufacture of a Sunderland Mk I was just over twice as much at approximately £100,000 (Cassidy, 1996). However, it is important to take account of the cost differential involved fitting out the same basic internal space. For the Empire Class, there needed to be comfortable

seating, attractive finishes, stewards' seating space, catering facilities and a substantial cargo hold. For the Sunderland, the company had to design for highly effective military capabilities, internally and externally, while purchasing and fitting state of the art military equipment. The latter was clearly much more challenging and costly than the former.

The Sunderland Mk I was equipped initially with a Vickers 303 machine gun in the nose turret plus four Browning 303 machine guns in the tail and had the capacity to carry up to 2,000 pounds in bombs. The aircraft was powered by four 1010 horsepower Bristol Pegasus XV II air-cooled radial engines, substantially more powerful than those of C Class Empire boats. Later versions of the Sunderland, commencing with the Mk III, were fitted with Bristol Pegasus XV III engines that increased the power to 1065 horsepower. The Sunderland Mk V was equipped with Pratt and Whitney R-1830 engines, producing 1,200 horsepower (Jones 2007). This engine was already in service with the American Douglas DC-3 and the RAF Consolidated PBY Catalina, which therefore provided common maintenance and reduced overheads. As the principal role of the Sunderland was reconnaissance, their range was also increased to allow for up to 14-hour patrols.



RAAF A26 Short Sunderland

Figure 22: RAAF No 10 Squadron A26 Sunderland (N9048, RB-A), England, 22 August 1941

Source: ADF - Serial Images Gallery. Album, RAAF 10 Squadron.

At the commencement of World War II, the British Government had assessed insufficient air strength as its primary weakness against Germany. It therefore notified its dominions (Australia, Canada, South Africa and New Zealand) 'that the most urgent requirement in the war was a steady and increasing supply of pilots, air observers, wireless telegraphy operators and air gunners' (Odgers, 1984, p.58). The Australian Government's response was to approve, on the 20 September 1939, 'an Australian expeditionary force of six squadrons to proceed overseas before the end of the year' (Herington, 1954, p.1).

Pilots from No 10 Squadron RAAF were sent to Pembroke Dock, Wales, in preparation for the arrival of nine RAAF Short Sunderland flying boats (see Figure 22 above). These aircraft were originally destined to form the nucleus of two RAAF long-range maritime reconnaissance squadrons to be based in Point Cook, Victoria, and to be deployed in defence of the Australian mainland (Herington, 1954). The Australian Government, in its desire to be of assistance with the empire war effort and having assessed that there was no immediate threat in the Pacific, offered the Sunderlands and their crews for service with the Royal Air Force (RAF). The UK accepted, and No. 10 Squadron earned 'the distinction of being the first air squadron of any Dominion country to go into action in the European theatre of war' (Odgers, 1984, p.58).

No.10 Squadron was placed under the control of the Coastal Command of the RAF, stationed initially at Pembroke Dock and in February 1940 redeployed to Mount Batten, in Plymouth Sound. These aircrew and maintenance staff were to experience the worst winter in 75 years in the UK. However, being the only squadron to be based at Mount Batten, they were able to initiate their own procedures and establish the intensive training required to detect submarines. Routine patrols were the essence of the squadron's tactical work, predominantly convoy patrols to the west of Ireland. A detachment of two Sunderlands was repositioned to Oban in Scotland in July 1940, to be joined by two additional aircraft in August 1940. The squadron developed an enviable reputation for efficiency, and was joined by a second RAAF Sunderland Squadron, No 461, in April 1942. Both squadrons contributed significantly to the defence of the UK throughout the war, particularly in their attempts to locate and destroy enemy U-boats. On 1 July 1940, Lieutenant W. E. Gibson RAAF attacked a submarine off the southwest of the Scilly Isles and was officially acknowledged for having assisted in its destruction, the first success for No. 10 Squadron during the war (Herrington, 1954).

The Sunderland soon proved itself a very effective weapon against the German U-boats and the Luftwaffe, in the process earning the nickname 'Das Fliegende Stachelschwein', or 'The Flying Porcupine' (Evans, 1987, p.1) in reference to its bristling guns. Crewmembers of both No. 10 and No. 461 RAAF Sunderland Squadrons were awarded 14 decorations for

gallantry in 1943 alone (Odgers, 1984), and had sunk a total of 12 submarines by the war's end (RAAF Museum, 2009). During World War II, 749 Sunderlands (encompassing all variants) were built at four different locations in Great Britain and Northern Ireland and it was regarded as the most successful flying boat of that period (Evans, 1987). The efficacy and robustness demonstrated by the various Marks of Sunderland throughout the war years confirmed that this was truly a formidable aircraft. Ongoing post-war developments of the Sunderland and its derivatives affirm this, with many aircraft undergoing conversion to civilian airliners and remaining in operation in Australia until September 1974.

### *QEA and the Horseshoe Route*

At the commencement of World War II, the Australian government directed QEA to suspend their service to Singapore based on the fear that Italy and Japan might enter the war. The order was rescinded after only four days, it having been determined that Italy and Japan were unlikely to act at that stage. The scheduled services were, however, reduced from thrice to twice weekly and airmail surcharges were reinstated in order to reduce the quantity of freight. The original three services per week to the UK had carried 4,900 passengers, and freight had increased from 73,027 pounds to 183,839 for the 1938 to 1939 period. QEA continued its service, albeit curtailed, maintaining its enviable reputation for having had no injuries to passengers or flight staff since its inception in 1934 (although two Empire C Class boats had been seriously damaged) (Fysh, 1968).

Italy entered the war on 10 June 1940 and, in so doing, cut the Imperial air route across the Mediterranean from both Africa and Australia. However, pre-planning for such an event by what had become the British Overseas Airways Corporation (BOAC) allowed the conjunction of the two main Imperial flying boat routes at Alexandria, resulting in the formation of 'The Horseshoe Route' (see Figure 23 below).<sup>9</sup>

The intent was for the flying boats to bypass Europe altogether, the aircraft plying instead a route with its extremities in Durban, South Africa, to the west and Sydney to the east (Air Ministry, 1946). Engineering workshops had already been established by QEA at Rose Bay in Sydney, and a new servicing facility was established in Durban. The initial westbound service departed Sydney on 19 June 1940, crossing sixteen countries prior to arriving in Durban. Overall, the Horseshoe Route linked forty-three ports between Sydney and Durban,

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<sup>9</sup> This title was adopted due to the obvious fact of the shape of the route which, when outlined on a map of the world, resembled an inverted horseshoe (Cassidy, 1996).

essentially maintaining the peacetime routes established by EAMS but with a detour via Africa to avoid Europe and the Mediterranean.

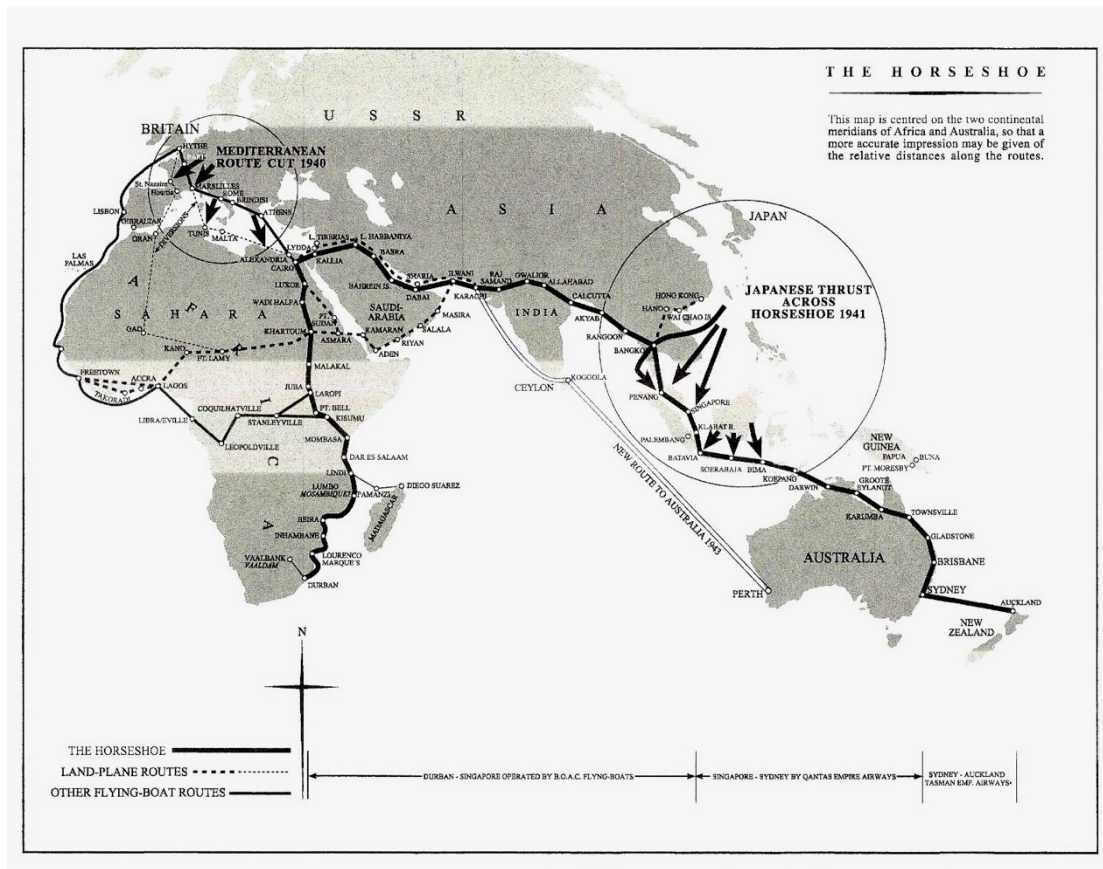


Figure 23: The Horseshoe Route

Source: Ministry of Information (1946), *Merchant Airmen*, pp.46-47.

The hub of the service was at Cairo where a control centre was established to monitor operations. Westbound mail from Australia and New Zealand continued to the UK via a shipping link, and transit passengers were embarked on landplanes to cross the Sahara Desert. This link was also lost when the overflying of mainland France was denied by the German occupation on 28 June 1940 (Cassidy, 1996, p. 49). On 6 August 1940, the first West African service arrived in Lagos from Poole in the UK. The flight then continued in a south easterly direction to Libreville and Leopoldville, turning to the North East to Coquilhatville, then proceeding easterly to Laropi, Port Bell and Kisumu at which point, the aircraft were reconnected to the Horseshoe Route (Cassidy, 1996).

The Horseshoe route continued to be used by the Empire boats for a total of six years, thirty-seven weeks and five days (Cassidy, 1996), and '[a]s the war in Africa and the Middle East ebbed and flowed, so the Horseshoe was rerouted, expanded or curtailed to match events' (Sims, 2000, p.195). According to the then RAF Air Chief Marshall Tedder the

Horseshoe route 'played a vital role ... in the communications that lay behind our Middle East campaigns' (Air Ministry, 1946, p. 49).

### *Sinbad's Legacy*

The surge in industrialisation of the Americas and Europe during the first half of the Twentieth Century had created a growing demand for fossil fuels, and petroleum in particular, prior to World War II. Oil exploration companies regularly operated in remote regions, creating a requirement for expeditious transport of personnel. Seaplanes, and particularly amphibious ones, had already established their versatility in operating in areas with limited access to land aerodromes, such as the remote regions of Papua New Guinea (PNG). The Australasian Petroleum Company Pty Ltd (APC) was a joint venture between the Vacuum Oil Company of Australia, the Anglo-Iranian Oil Co. and Oil Search Ltd. of the United States (McGuiness, Crick, Mackenzie and Cowan, 2015). They contracted a U.S. firm, Fairchild Aerial Surveys Corp., to carry out an aerial survey of PNG. In 1939 APC imported a Douglas Dolphin amphibian into PNG to augment a land-based Fokker Trimotor FV11b-3m that had commenced surveying the previous year.

The APC Dolphin arrived by ship in Brisbane on New Year's Day 1939, prior to being flown to PNG. It retained its civil registration in the USA throughout its entire operation in PNG. Together, the Dolphin and the Fokker Trimotor:

...covered 28,000 square miles in what was described as 'the most difficult scientific flying that had ever been carried out in New Guinea. The maps that resulted were the basis of the exploration work that followed'. (Goodall and Eyre, 1987, p.18)

In early 1940, as the oil exploration survey in PNG was being brought to its completion, the Australasian Petroleum Company generously donated its Dolphin to the RAAF. Coincidentally, while anticipating the arrival of the RAAF Catalinas, Australia was once again faced with a shortage of aircraft and the RAAF was looking for a suitable twin-engine amphibian to conduct asymmetric training. The APC Dolphin was allocated the RAAF designation of A35-1 and delivered to No 9 Fleet Cooperation Squadron at RAAF Station Rathmines<sup>10</sup> on 17 June 1940. Dolphin aircraft had been deemed to an 'outstanding success' (McGuiness, 2015, p.1) by both military and civilian operators in the USA, and A35-1 also proved to be very effective in its training role at Rathmines. As a result, further Dolphins were requested by the RAAF. The Australian Government, under the auspices of the Australian

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<sup>10</sup> Rathmines is on Lake Macquarie, near Newcastle, NSW. Lake Macquarie is the largest coastal saltwater lake in Australia.

Production Commission, managed to purchase three additional aircraft from sources in the USA. These were delivered to the RAAF Rathmines base during 1942 and 1943 (Goodall, 2014).

The later three Dolphins (the A35-2, -3, and -4) had operated in civilian roles in the USA, and as a result RAAF aircrew were initially provided with an unaccustomed level of luxury: 'Aircrew found them easy to fly and given their ancestry, quite comfortable and spacious when compared to other seaplanes of the era' (McGuinness, 2015, p.1). Ground crew also found the aircraft easy to maintain, although spare parts for the Dolphin were difficult to procure in wartime conditions. To accommodate this situation, interchangeability of components became commonplace and necessary, to the extent that three of the Dolphins were reduced to spare parts by the end of the war, leaving only one serviceable aircraft (Goodall, 2014). Goodall and Eyre (1987) note that after the war, Donald Douglas, who had personally designed the Dolphin, commended the Rathmines' effort in virtually rebuilding A35-3 (Figure 24) to keep it in service during 1943/44, using many spare parts from A35-1 and -2' (p.21). These four aircraft performed more than adequately in their stopgap training and communication roles. There is little doubt that these roles would have been considerably expanded had it not been constrained by the availability of spare parts.

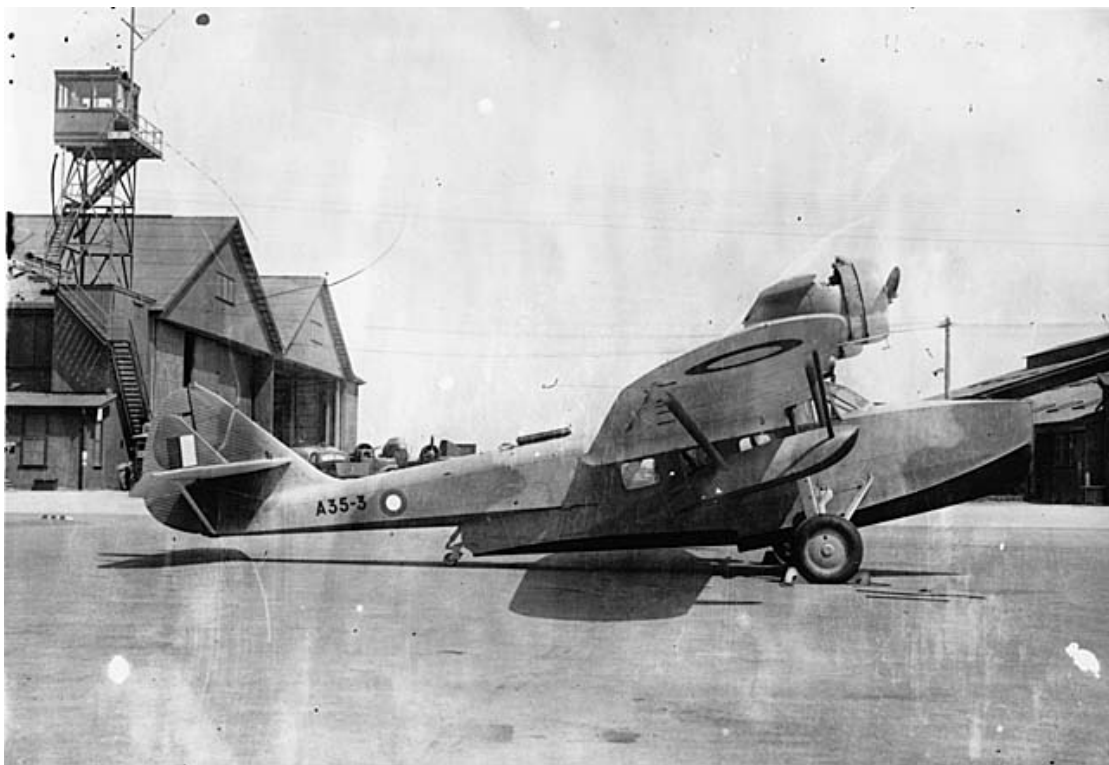


Figure 24: The RAAF's Douglas Dolphin A32-3

Source: ADF Serials Image Gallery; Album, Douglas Dolphin. Photograph via Steve Mackenzie.

## *Catalinas and QEA*

The PBY-5A Catalina was designed and built by Consolidated Aircraft of San Diego. It was the result of a design competition instigated by the US Navy in 1932 to develop a new long-range patrol flying boat. The first aircraft flew in Norfolk Virginia on 15 March 1935, and its performance figures included a range of 2,990 miles at a nominated cruise speed in excess of 100 miles per hour (National Naval Aviation Museum). The Catalina, which derived its name from an island off the coast of California, was considered internationally to be 'the most successful flying boat ever produced' (Powerhouse Museum, 1951, p. 1). This success was demonstrated in its adoption by the military forces of the following countries:

1. Australia
2. Britain
3. Canada
4. New Zealand
5. Netherlands
6. Soviet Union
7. United States of America

Regarded principally as an excellent patrol aircraft, the Catalina was also very versatile in its field of operations due to its range, endurance and seaworthiness. This versatility was demonstrated by the fact that '[t]he PBY was involved in almost every major operation in World War II and figured significantly in defeating the U-boat menace in the Atlantic' (National Naval Aviation Museum).

The Catalina PBY (Figure 25) was an all-metal, high-winged, monoplane flying boat, powered by two 1,200 horsepower Pratt and Whitney Twin Wasp R-1830 engines. By war's end, this engine was used by all of the allied services. This was the first American production aircraft to be equipped with radar, and its use allowed crews to track Japanese ships at night to locate and rescue allied personnel, who had been stranded in boats and dinghies (Powerhouse Museum, 1951).

The Australian Government asked QEA to deliver a number of Catalina PBY flying boats from the USA to Australia in August 1940. The consideration was that, because the USA was not yet involved in World War II, civilian crews should deliver the Catalinas that had been ordered for the RAAF. The aircraft were required urgently for reconnaissance duties along the vast Australian coastline, and to boost the severely depleted number of aircraft available to the RAAF due to its dispatch of squadrons to the UK. On arrival at the Consolidated factory in San Diego, the initial QEA crew (led by Captain Lester Brain) observed 20,000 employees



producing sixty aircraft per month, including thirty-five PBVs. On return to Sydney, Captain Brain's favourable impressions of the Consolidated Aircraft Company's production line were reported to the QEA board. At a later point in QEA's history, these observations of a modern and efficient production process were factored into the final selection by QEA, of the Lockheed Constellation over more dated technology being presented by the UK. Australia's longstanding dependence on British manufactured aircraft was thus broken (Fysh, 1968).

The first RAAF Catalina to cross the Pacific was presented with unique challenges, given the scarcity of suitable refuelling points. Under the command of Captain Lester Brain, the Catalina departed San Diego on 25 January 1941, covering a distance of 3,000 miles before arriving in Honolulu twenty-two hours and five minutes later. The fuel remaining on arrival was sufficient for an additional four to five hours of flight, highlighting the superlative reconnaissance capabilities of this aircraft. The last of the nineteen deliveries to Rathmines RAAF base north of Sydney departed on 22 October 1941, also flown by Captain Brain. This concluded a highly successful operation, completed without any significant problems. Air Chief Marshall, Sir Charles Burnett, wrote: '[w]ill you please convey to those concerned ... the great appreciation of the Air Board and myself personally for the way in which these deliveries were carried out, which reflects great credit on the Company and those concerned' (Fysh, 1968, p.111).

The first of these delivery flights was only the third flight across the South Pacific in aviation history. It proved invaluable in the provision of navigational data and the expansion of future Pacific flights (Gunn, 1987).

In the course of World War II, the RAAF took delivery of a total of 168 Catalinas, carrying serial numbers commencing with A24 that represented the 24<sup>th</sup> aircraft type within RAAF service. The RAAF operated the later series of Catalinas that were designated:

1. Mks I and II (PB-5 flying boats)
2. Mk III (PBV-5A Amphibians)
3. Mk IV and Mk VI (High Tail – Radome Fitted) Boeing Built PB2B-1, -2.

The standard crew complement of a Catalina was between eight and ten however the flexibility of the Catalina was ably demonstrated on 13 August 1944, when Catalina A24-92 returned to Milne Bay in Papua New Guinea with 62 people on board having completed a successful search and rescue mission (Gaunt and Cleworth, 2000). 'A total of 3,290 Catalina flying boats of all types, including the amphibious variants, were produced by five different

companies in the USA, Canada and the Soviet Union between 1935 and 1945' (Oliver, 1999, p.71).



Figure 25: Historical Aircraft Society's Consolidated PBX-6A Catalina, *Felix* (Black Cat)

Source: HARS DSCF6405

## Conclusion

Prior to World War II, flying boats were generally seen to be at the forefront of aerial exploration and associated commercial enterprise. With few land runways, the flying boats' capacity to alight on any sheltered stretch of water appealed to both airlines and aircrews. The onset of the war changed that mindset, based on the demonstrably superior performance of the technically advanced US aircraft in combat situations. While flying boats retained an essential role, the strategic requirement for land-based aircraft ensured that the construction of land aerodromes was prioritised. The USA's entry into World War II allowed their expanding aircraft manufacturing industry to refine the development of land aircraft and necessitated the building of larger and more substantial land runways in allied nations such as Australia.

World War II brought vast changes to the burgeoning airline industry and the growth of emerging airlines in Australasia, such as Qantas, was heavily curtailed. The Empire Air Mail Scheme, which was seen as the initial driver of expansion for the legacy airlines of BOAC and

Qantas, had also contracted due to poor planning and political interference. This factor, combined with the immediate demand for aircraft to bolster the severely under-prepared military forces of both the UK and Australia, resulted in the reduction of civilian airline fleets and the redeployment of experienced personnel.

The war effort required the prioritisation of military aircraft production and delayed plans to re-equip commercial airlines with land planes. As a result, flying boats continued to ply the long distances between the UK and Australia. QEA and Imperial Airways initially continued flying on the route on a reduced schedule, after aircraft from both fleets were seconded for military use. When Italy entered the war, the pre-planned 'Horseshoe Route' was instigated.

Australia's imperial connectedness was tested at the very onset of World War II, with a RAAF flying boat squadron being the first allied aircraft to join the conflict. At the outbreak of war, No.10 Squadron was seconded to the RAF for maritime patrol in the hunt for German U-boats. A second Australian Sunderland Squadron joined No. 10 Squadron in 1942, with both squadrons remaining in the UK throughout the war. Their contribution to the Allied war effort earned their members fourteen decorations for gallantry, highlighting the effectiveness of the Sunderlands' use for maritime reconnaissance, and in the process confirming Australia's allegiance to the UK.

The arrival of the first of the RAAF's Catalina's in Australia was to be a milestone for the future path of Australian aviation. The aircraft became an agent for change in three significant directions:

1. Catalinas were designed and manufactured in the USA, and therefore reflected a distinct philosophical change on the part of the Australian Government from its previously held commitment of purchasing imperial aircraft.
2. Although their principal role was designated as flying boats, many Catalinas also had the ability to be amphibious, signalling the changing role of future aircraft operations favouring landplanes.
3. Catalinas proved themselves to be capable of safe and efficient long-range operations, and in the process increased the confidence of the public in the potential of long range airline operations.

Particularly significant was the fact that Australia's experience with the Consolidated PBY Catalina during World War II foreshadowed the direction in the future selection of aircraft

for Australian aviation in general. Crucially, it fractured the sense of imperial dependency that had been expressed through policies of connectedness through aviation.

## Chapter 6: Japan enters the War

### *QEA and World War II*

The events leading up to the entry of Japan into World War II sharply defined the future operations of Qantas Empire Airways. In an attempt to win the Portuguese Government's support in favour of the Allies QEA had commenced a fortnightly service into Dili in Portuguese Timor on 19 January 1941 (Gunn, 1987). Shortly thereafter BOAC became overburdened with their wartime requirements and asked QEA for assistance on the Horseshoe Route. QEA once again complied in order to support the imperial war effort. It now had responsibility for providing the westbound section of the Horseshoe Route as far as Karachi. This almost doubled the distance flown from 4,681 to 8,698 miles. This commitment was made even more demanding by the fact that QEA's already small fleet of four C Class Empires had been further reduced when an additional two were pressed into RAAF service in mid-1940 (Gunn, 1987).

The United States entered the war on 7 December 1941, when the Japanese attacked Pearl Harbor. The following day, the Japanese arrived on Singapore soil: 'For the first time in its history, Australia was immediately and directly imperiled' (Gunn, 1987, p. 41).

With Japan's entry into the war, QEA endured the most demanding time in its history. Flights from Rangoon were rerouted through Port Blair, Sabang, and Medan to Singapore, then Singapore was soon bypassed in favour of Batavia. The new service to Dili was abandoned. The airline and its C Class boats fulfilled a major role in the war effort, carrying 7,600 passengers, 240 tons of freight and 296 tons of mail on its primary route between Sydney and Singapore in 1941 alone (Gunn, 1987). 'QEA was now flying one and a half million miles a year, almost all on airline operations' (Gunn, 1987, p. 42).

In the early months of Japan's occupation of the Malay peninsula, QEA had many near encounters with enemy aircraft. Given that they were unarmed civilian aircraft, their crew were tasked with visual avoidance. At dawn on 30 January 1942, however, the Empire C Class flying boat *Corio* departed Darwin to evacuate women and children from Surabaya in Indonesia. Approaching East Timor, Captain Koch and his aircraft were attacked by seven Japanese Zero aircraft resulting in *Corio* crash-landing into the open sea adjacent to Koepang. Of the eighteen persons, aboard seven escaped into the sea, but only five of these succeeded in swimming through shark and crocodile-infested waters to the beach that was about five miles distant ('Lost Flying Boat', *The West Australian*, February 12 1942, p.4). This was the first loss of either passengers or crew that QEA had experienced since its formation, and tragically occurred through enemy action under war conditions.

## Darwin

The loss of *Corio* elicited a swift response by the Australian Government. The Batavia to Darwin section of the Empire route was suspended one day after *Corio*'s demise, on 31 January 1942 ('Japs Attack Flying Boat', *Army News*, Darwin, February 5 1942, p.4). Shortly after, on 14 February, eastbound services were also suspended at Calcutta. Combined with the Darwin suspension, the Empire route was now effectively cut. In anticipation of such an event, prior approval had been obtained from the Australian Government to operate a 'reserve route' from Tjilatjap on the south west coast of Java, directly to Broome on the west coast of Australia. The advance of Japanese forces was rapid though, and Singapore surrendered on 15 February (Air Ministry, 1946).

On the morning of 19 February 1942, Japan launched their first of sixty-seven air attacks on Darwin and its nearby airfields. *Camilla*, the QEA C Class flying boat, was at her moorings just 200 yards southeast of the jetty in Darwin harbour. After the first wave of Japanese aircraft departed, QEA Captains Crowther and Hussey managed to board *Camilla*. After ascertaining that she had sustained no damage, they cast off from her moorings and departed for Groote Eylandt in the Gulf of Carpentaria. Approximately eight minutes after they became airborne, *Neptuna*, an ammunition ship that had been moored directly adjacent to *Camilla*, exploded causing extensive damage to Darwin jetty and nearby boats and buildings (Bennett-Bremner, 1944). *Camilla* refuelled at Groote Eylandt and returned to Darwin that evening at sunset, with the intention of departing for Sydney early the following morning.

Darwin had been relatively unprepared for the Japanese attack and as a result, the damage sustained was substantial. The Japanese aircraft sank nine of the forty-five ships in Darwin harbour and severely damaged thirteen others. Two Catalina flying boats were sunk at their moorings and Darwin land aerodrome also received extensive damage to both aircraft and buildings. *Camilla* departed Darwin at first light the following day with a full load of passengers, including the stretcher-borne Captain Koch from the ill-fated *Corio*. Their remarkable escape and southbound flight to Sydney was completed without further incident ('Town Stunned by Sudden Attack', *The Advertiser*, Adelaide, February 23 1942, p. 1). The QEA C Class flying boats *Circe* together with *Coriolanus* departed Tjilatjap for Broome on the 28 February, on what would be one of the last of the shuttle flights to Australia. The two aircraft were in radio contact with one another for approximately two hours and then contact was lost. Later investigations concluded that *Circe* was intercepted and shot down by Japanese aircraft, and all on board perished, including 20 women and children evacuees (Air Ministry, 1946). Despite these events, '[t]he repeated conspicuous acts of bravery in front of enemy action by Qantas pilots and staff are not well known and were in fact deliberately unrewarded due to

government policy at the time' (Bennett-Bremner, 1944). Overall the Japanese air raids on Darwin in 1942 resulted in the loss of 247 lives, which constituted the largest loss of life on the Australian mainland in World War II.

### *Attack on Broome*

As the advance of the Japanese military forces through South East Asia was overwhelming the Netherlands (Dutch) East Indies, a decision was made by Allied command in late February 1942 to evacuate the remaining Dutch and Allied civilians by air to Broome. Both the land and water airports at Broome, which were under the control of the United States Army Air Force (USAAF) had been increasingly used for staging and refuelling, as aircraft operated the shuttle service between Tjilatjap, Broome, and Perth. Using primarily land planes, supported by flying boats, the shuttle service evacuated over 8,000 people from Java. This remarkable statistic reveals the world's largest airlift of people at that point in history (Jung, 2006).

Confident with the efficacy of its destructive attacks on Darwin and intent on pursuing its domination of South East Asia and Northern Australia, the Japanese made a pre-emptive reconnaissance flight over Broome on 2 March 1942. The flight was conducted by a Japanese Navy Kawanishi H6K4 flying boat at an altitude of approximately 9,000 feet. Having determined that there were no fighter aircraft in the area, it 'made three circuits of the bay and then departed' (Shaw, 2014, p.57). The following morning at 9.30 am, one Japanese Naval Mitsubishi C5M2 'Babs' reconnaissance aircraft and nine Japanese Mitsubishi A6M2 Zero Model 21 fighters commenced an air raid on Broome with the intention of neutralising both the land and water airports (Jung, 2008). This devastating aerial attack, lasting approximately twenty minutes, destroyed 22 allied aircraft including 15 flying boats moored in Roebuck Bay (Gunn, 1987). The flying boats belonged to four nations, Australia, the UK, the Netherlands and the USA. All had been engaged in evacuating refugees from Java, and eleven of the aircraft moored in the bay that morning still had evacuees on-board. With the exception of one United States Navy (USN) floatplane, a Scout Observation Curtiss Seagull (SOC-3) that managed an expeditious departure, all of the flying boats in Roebuck Bay were destroyed and sunk.

The overall death toll of the Broome raid exceeded 80 people. That death toll may have been higher, if it were not for the crew of a sixth Dornier DO-24k, X36, who were unable to locate Broome on the evening of the 2/3 March 1942. Due to a Defence directed black-out that evening, the Royal Netherlands Navy flying boat bypassed Broome and continued 155 miles further south until eventually running out of fuel and undertaking a forced landing near

Anna Plains (Dunn, 2007). Ten of the flying boats at Broome have subsequently been located and identified, whilst the scattered remains of six of the aircraft, remain visible at low tide (Jung, 2008).

Broome's Roebuck Bay contains a sunken armada of flying boats from World War II ... No other place in the world has such a collection of rare and historically significant flying boats, all of which were sunk in a matter of minutes of each other, creating a snap shot of a tragedy in Australia's aviation history (Jung, 2006, p.1).

### *Lake Boga*

Shortly after the demoralising attacks on Darwin and Broome, Sir Hudson Fysh, QEA's Managing Director, was deliberating on the rapid southward advancement of the Japanese forces. Paramount in his thoughts was the likelihood of an attack on the Rose Bay flying boat base. In the short span of three months since Japan had entered the war, QEA had lost the following six C Class Empires:

1. Corio – shot down and sank near Kupang.
2. Circe – shot down en-route Tjilatjap to Broome.
3. Corinna – sunk at Broome.
4. Centaurus – on loan to the RAAF – sunk at Broome.
5. Coogee – on loan to the RAAF – crashed while alighting at Townsville; damaged beyond repair.
6. Corinthian – crashed and sank while alighting at Darwin.

QEA could ill-afford to lose further aircraft and began to consider an emergency inland base, given the obvious strength of the Japanese naval forces. Scouting parties were sent to investigate potential sites in western New South Wales and Victoria. Lake Boga in north-western Victoria was chosen as a 'safe haven for flying boats and amphibians [and] was deemed essential for the defence of Australia' (Lake Boga Flying Boat Museum, 2012). Suitable infrastructure was already in place, however a slipway, jetty and hangars had to be built. The site was ideally located as it was serviced by a railway, had a nearby land aerodrome at Swan Hill, and Lake Boga itself was clear of obstructions and surrounded by flat terrain. QEA personnel, together with spare engines and stores were dispatched from Sydney, but the actual requirement for use as an alternative base by QEA never arose (Fysh, 1968).





Figure 26: Consolidated Catalina PBY at Lake Boga Flying Boat Museum

Source: Author's Collection.

Although QEA had abandoned its plans to occupy the site, the Department of Air decided to establish its own inland flying boat repair depot at Lake Boga (Heritage Victoria, 2015). Based on a comparable logic to that of QEA, the RAAF considered that its northern bases and its principal coastal base of Rathmines, were vulnerable to an attack by the Japanese forces. The RAAF occupied the Lake Boga base as the No. 1 Flying Boat Repair and Service Depot, maintaining and servicing, large numbers of aircraft throughout the war period ('Flying Boat Base, *The West Australian*, Perth, August 16 1944, p.3). According to Heritage Victoria, 'in all, 416 aircraft were serviced and repaired at the base, including Catalinas, Dorniers, Kingfishers, Short Sunderlands, Supermarine Walruses and Martin Mariners' (Heritage Victoria, 2015). With over 1,050 aircraft arrivals and departures, including many allied flying boats, 'no aircraft met with a major mishap' (Lake Boga Flying Boat Museum, 2012).

On the night of 8 June 1942, Sydney Harbour Bridge was the target of an attack by a Japanese submarine located nine nautical miles south east of Macquarie lighthouse in Sydney. Twelve shells were fired from the submarine, with one landing directly adjacent to the Rose Bay Flying Boat Base in Manion Avenue, Rose Bay. Sir Hudson Fysh's predictions were perilously close. Fortunately, little damage was sustained ('Submarines Shell Sydney and Newcastle', *Barrier Miner*, June 8 1942, p. 1).

## *Rathmines*

Rathmines RAAF Base on the shores of Lake Macquarie was on a site of approximately 80 acres that was selected in 1938. Construction commenced the following year on the 'Tin City' buildings that were to become the largest seaplane base in the southern hemisphere (Wells, 2013). The base operated predominantly as a major maintenance and repair facility and as the principal Operational Training Unit (No. 3 OTU) for all aircrew converting to flying boats and seaplanes. During World War II it also accommodated Squadron Nos 9 (Walrus), 11, 20 and 43 (Catalina), 40 (Sunderland and Martins), 41 (Dornier, Martins and Empires) and 107 (Brooke, 2006).

The first Catalinas, as described earlier, arrived at the base in 1941, and were crucial in providing support for the RAAF's wartime operations against Japan. Operational duties included reconnaissance, mine laying, bombing, supplying troops, transport and air sea rescue. The black painted RAAF Catalinas became famous during World War II, and in one very notable operation in December 1944 were praised

for their precision laying of mines in enemy water ways and harbours [including] the mining of Manila Harbour [which] involved 24 RAAF Catalinas, eight of which were out of Rathmines. This operation was possibly the longest operation flown from Australia during the war. (Saxon, 2008, p. 2).

The mine laying operation was pivotal in assisting General Douglas MacArthur's landing at Mindoro in the Philippines, by ensnaring the Japanese fleet in Manila Bay (Piper, 2009). The Rathmines base also played a significant role in the Battle of the Coral Sea, which was to prove crucial to the ongoing sovereignty of Australia.

At the core of Rathmines operations was the Operational Training Unit (No 3 OUTU) for Catalina crews, which processed over 200 aircrews in the course of the war. This primary function was supplemented by its significance as a repair facility, and '[a]t its peak, over 3,000 men and women served at the base, which comprised 230 buildings and marine facilities' (Brooke, 2006, p. 1). The location of the base was regarded as ideal, and '[s]ituated on the pleasantly wooded shores of Lake Macquarie ... [the] flying boat station well-deserved its soubriquet of the "Air Force Country Club", having all the attributes and facilities of an exclusive holiday resort' (Monkton, 2002). The reliance by the RAAF on its Catalina aircraft is demonstrated by the fact that these aircraft were the only aircraft to remain in service throughout the whole of World War II.



Figure 27: Rathmines RAAF Base Monument

Source: Author's Collection.

### *Catalinas and the Secret Order of the Double Sunrise*

Following consultation with the Australian government, William Hildred, the UK's Director General of Civil Aviation, reached a momentous decision. On 22 April 1943, he advised Sir Hudson Fysh that QEA would be directed to establish services across the Indian Ocean between Perth and Lake Koggala in Ceylon. These flights were to be operated using Catalinas (Figure 26) supplied by the British Air Ministry, and effectively allowed QEA to reopen the Horseshoe Route connection to Australia. The RAF flew seven return survey flights from Ceylon to Perth from the 3 May 1943, using the first two of the Catalinas that the UK had loaned to QEA. The final flight of these surveys was the delivery of the first QEA Catalina to Perth (Gunn, 1987). 'The first officially recognised scheduled flight of the Qantas service



IQ-1 left Lake Koggala ten days later for Perth on 10 July ... with [Captain Russell] Tapp in command' (Gunn, 1987. p.107).

This first official flight across the Indian Ocean was regarded by Sir Hudson Fysh as one of the most important milestones in the history of Qantas, as this flight broke the Japanese air blockade and reinstated QEA as an overseas service (Fysh, 1968). It was their task to initiate the longest nonstop regular passenger air service ever attempted in the world. For Qantas, it was the company's reinstatement as an overseas operator and the renewal of the Australia air link that had been severed by the Japanese (Gunn, 1987, p. 106).

The initial scheduled service had a flight time of 28 hours and 10 minutes and covered 3,580 miles, non-stop. Under an agreement with BOAC, QEA were to crew and service the five Catalina aircraft, whilst ownership continued with BOAC. These aircraft, which were originally supplied to the UK under the US Lend Lease program, retained their British Civil Aviation registrations and RAF camouflage with Qantas Empire Airways inscribed on the side forward fuselage (Fysh, 1968). After a short period of operation, the aircraft were progressively modified by QEA maintenance at Rose Bay. These modifications included removal of de-icing equipment and the addition of fuel tanks fitted with dump valves, which had been insisted upon by Sir Hudson Fysh.

These modifications proved crucial to the Catalinas' usefulness. The valves proved their worth on at least six occasions, when fuel had to be dumped from the Catalinas, contributing significantly to the safe resolution of the emergencies (Fysh, 1968). The modifications also enabled British and Australian civil authorities to approve an increase in the flying boats' total weight of 29,000 pounds to 35,300 pounds (Senior, 2014) This additional weight increase had been trialled by the RAF Catalina Squadron at Trincomalee (in Ceylon), and was no doubt influential in the civil authorities' final approval. As a result of the combined weight increase, assembly modifications and engine/aircraft operating procedures, the maximum range at normal cruising speed of 115 knots to 4,650 miles or 36 hours endurance. (Gunn, 1987).

Great ingenuity was required to maintain the early flights. These departed initially from the USN Catalina Squadron base at Crawley Bay on the Swan River in Perth. As operations progressed, a move to the nearby suburb of Nedlands occurred, where QEA established its own maintenance facility. Norm Roberts, a senior QEA station engineer who had been based in Darwin during the Japanese bombing, was deployed to the newly-created Perth base along with the chief engineer, Colin Sigley. Reflecting on Sigley's arrival in Perth, Roberts commented that "[h]e arrived with 50 spark plugs bought en-route from Melbourne. That was

the extent of his spare parts” (Byrnes, 2000, p. 150). Major maintenance of the US-manufactured Pratt and Whitney R-1830 Twin Wasp Aero Engines, which powered the Catalinas, was carried out initially by the RAAF at Kalgoorlie. Foreshadowing the development of the Australian manufacturing industry, ‘many of [the] engines used on this long hazardous run were completely made in Australia at the Department of Aircraft Production annex at Lithgow’ (Fysh, 1968, p.188). The robustness and reliability displayed by these engines led to the notion that they were ‘probably the most important piston aero engine designs ever built’ (Museum Victoria, 2015, p.1). World War II was, by necessity, a catalyst for the embryonic Australian aircraft and components manufacturing industry.



Figure 28: Catalina and QEA Base, Nedlands, Perth

Source: *The Double Sunrise Flight*, Senior (2014).

All five Catalina aircraft were reconfigured for weight reduction purposes to be unheated, unlined and were, as a result, exceptionally noisy for both the crew and passengers. The six crew members normally comprised the Captain, First Officer, Second Officer, Navigation Officer, Radio Operator and Flight Engineer. As Neal noted, ‘[t]he payload consisted of three V.I.P. passengers (each limited to 30lb. of baggage), diplomatic mail, urgent freight – mainly for the armed services – and airgraph mail’ (Neal, 1968, p. 26).

The need for airgraphs arose as a result of the lengthy delays in the delivery of correspondence between troops stationed in the Middle East and their families in the UK. When Italy entered the war, the Mediterranean was effectively closed to British and Allied

shipping, with the end result that the majority of sea mail was then transported to the UK via the Cape of Good Hope (Yell and Fletcher, 2011). The UK commenced their airgraph service in 1941, however Australia had implemented its own airmail letter card service to its troops in the Middle East and was reluctant at that time to replicate the British system. The fall of Singapore and the resultant disruption of air services brought about an abrupt change of mind and “[i]n May 1942 the Australian Government decided to join the airgraph service” (Yell and Fletcher, 2011, p. 122).

The cost of an airgraph for service personnel remained the same as the cost of an aerogramme, however the volume and weight of film was one-fiftieth the weight of normal airmail. By the time of the closure of the service on 31 July 1945, approximately four million airgraphs had been sent from Australia (Yell and Fletcher, 2011) and 330 million airgraphs had been delivered world-wide over a period of four and a quarter years (Senkus, 2007). According to the curator of the Qantas Founders Museum, more than 51,600 kilograms of microfilm were carried by the Double Sunrise flights (Harwood, 2015). Such an amount reinforces the statement by the Director General of the Post Master General’s Department that “[t]here is no doubt [...] that this splendid innovation met an urgent need under war conditions and afforded the means whereby it was possible to maintain speedy communication with our compatriots serving in different countries’ (Yell and Fletcher, 2011, p. 127).

Initial flight routing for the Catalinas proceeded from Perth, ‘parallel to the coast up to Cape Inscription near Exmouth Gulf, then follow a Great Circle track across the Indian Ocean to Lake Koggala, 80 miles south of Colombo’ (Senior, 2014. p. 6). Later flights routed from the western end of Rottnest Island, just off the coast of Perth, directly to Galle in Ceylon. West bound altitudes tended to be flown at lower levels, within the range of 1,000 feet to 2,500 feet to avoid unfavourable winds, whilst east bound flights sought more favourable winds at higher altitudes. Average flight time was 28 hours, with 27 hours and fifteen minutes being the shortest time and 32 hours and 10 minutes the longest journey (Senior, 2014). All flights were carried out in strict radio silence with the exception of one short unrepeated broadcast, updating meteorological information (Senior, 2014). The aircraft’s progress was highly dependent on accurate celestial navigation, dead reckoning and consummate piloting skills. This dependency was recognised in the naming of the five aircraft after the stars used for navigation: Altair Star, Vega Star, Rigel Star, Antares Star, Spica Star (Fysh, 1968).

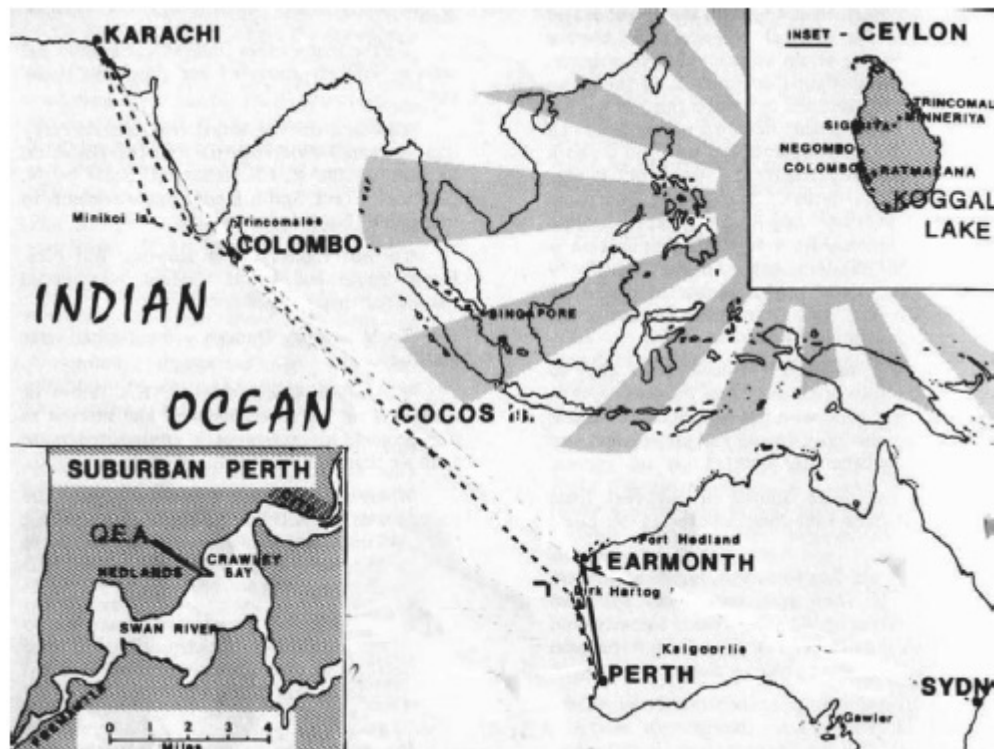


Figure 29: Initial QEA routing from Perth to Lake Koggala in Ceylon

Source: The Double Sunrise Flight, Senior (2014).

Demand for the service soon increased from once a week to three times a fortnight. This additional demand brought the ongoing surface transport component from Galle to Karachi into question. 'On 4<sup>th</sup> November 1943 Captain Crowther inaugurated the Koggala-Karachi extension, which added another 1,574 miles to the route, now totalling 5,087 miles' (Fysh, 1987, p.187). At Karachi, the QEA operation terminated and the ongoing segments on the Horseshoe Route were carried out by BOAC.

All but one of these Indian Ocean crossings involved more than 24 hours in the air. The 'Secret Order of the Double Sunrise' was a certificate created by QEA's Sir Hudson Fysh (see Figure 30) to honour passengers who had spent such a time in the air ('Indian Ocean Air Hop', *Townsville Daily Bulletin*, August 8 1944, p. 3). Upon completion of the final flight, which departed Perth on 12 July 1945, 271 accident-free crossings of the Indian Ocean had been achieved, over 207,260 pounds of mail had been delivered, and 858 passengers had been carried. The total miles flown were 1,380,119, and an impressive 90,793 pounds of freight had been transported (Fysh, 1986). QEA's Manager of Western Operations, Captain Crowther, 'noted in September 1943 that no other air service in the world approached the distances flown on the QEA Indian Ocean route' (Gunn, 1987, p. 108).



Figure 30: 'Secret Order of the Double Sunrise' certificate

Source: Qantas Heritage Museum with permission of David Crotty (Curator).

The Lend Lease aircraft were unceremoniously handed back to the RAF at the end of the war, having been deemed to be of no further use. They were towed out to sea and scuttled off Rottnest Island (Fysh, 1968). Their inglorious end belied the contribution that the collection of aircraft had provided to Australia during a proud and memorable period in the nation's aviation history.

These unarmed flights were classified as 'Top Secret' and their success is a wonderful reflection on the professionalism of all the personnel concerned with the operation. The aircrew's performance went unrecognised by both civil and military authorities, contrary to the forceful representations made by Sir Hudson Fysh. Independent aviation organisations were more generous in their approach with the result that Captains Crowther, Tapp and Ambrose were the joint recipients of the Johnston Memorial Trophy, one of the most prestigious awards within the aviation world. The citation reads:

The Guild of Air Pilots and Air Navigators of the British Empire considers that the work performed by Captains W.H. Crowther, R.P. Tapp and L.R. Ambrose constitutes an outstanding feat of Airline Navigation and we have great pleasure in adding their names to the names of those distinguished



navigators who have preceded them in establishing similar performances in the past (Fysh, 1968, p.193).

The Trans Indian Oceanic Service was the longest nonstop passenger service in the world and was highly successful. It was essential to Australia as a nation at war, isolated from key allies, and it also allowed the reestablishment of QEA as Australia's overseas airline. Its significance for Australia's national history is inestimable.

### *Politics and Frigate Bird*

Australia's imperial relationship with the UK was to be tested on many occasions throughout World War II. The UK's failure to adequately defend Singapore, one of the jewels in its Asian crown, alerted Australia to the alarming realisation that it could not rely solely on the Mother Country for its defence. The Australian Government was faced with the recognition that a combination of self-reliance and new alliances were required if its strategic position was to be maintained and strengthened in the post-war era (Day, 1992).

Independently, P.G. Taylor (one of Australia's foremost aviation pioneers) perceived that there was a need to establish an air route across the South Pacific to Europe. This potential air route would bypass Hawaii and in so doing, break the monopoly established by the USA on Pacific air traffic. Taylor suggested that the route would additionally fulfil the supplementary functions of avoiding any potential conflict with the Japanese, as it would be considerably to the South of their sphere of operations, and it would also serve to foster Australia's post-war ambitions (Taylor, 1948). Taylor encountered opposition to his intended exploratory flight from General Macarthur, who at that stage was based in South West Pacific Area headquarters in Melbourne. The American Air Transport Command, which was staffed in its upper echelons principally by pre-war airline executives, enlisted Macarthur's endorsement to assist in blocking any potential air route that would bypass the well-established route via Hawaii. With President Franklin D. Roosevelt's support, these executives were focused on post-war commercial air routes, in addition to their wartime responsibilities (Day, 1992). Macarthur, in turn, pressured Australian Prime Minister Curtin to reinforce his opposition to the intended air route, leaving Taylor isolated and without any credible Australian government backing.

Having received no encouragement from Macarthur, Taylor went to the UK in late October 1942 in an attempt to appeal to that country's Air Ministry. Having achieved only the limited backing of Australia's Minister for External Affairs, H. V. Evatt, he argued his case to the Under Secretary of the State at the Air Ministry, Harold Balfour, who had been his flying instructor during World War I. The UK, although sympathetic to Taylor's plans, was fully

occupied with its European conflict and was of the view that the Pacific air routes were the domain of the USA (Day, 1992). Once again Australia's political isolation was highlighted.

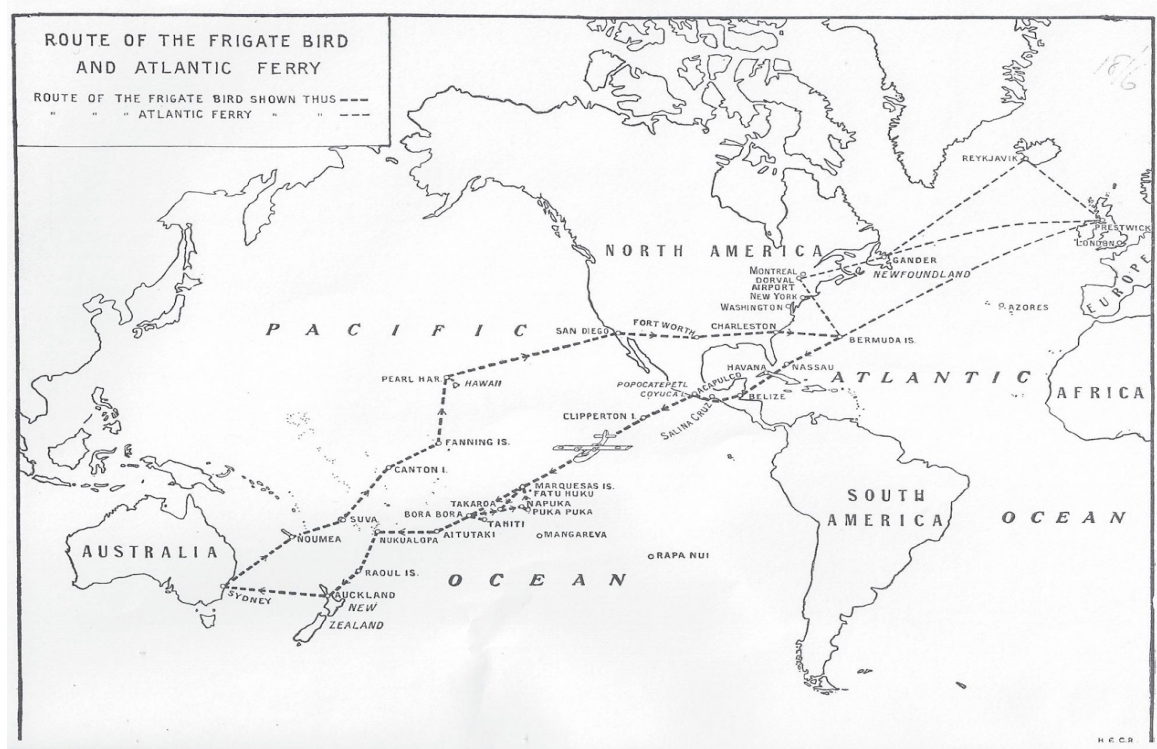


Figure 32. Route of the Frigate Bird to Clipperton Island and Australia.

Source: Taylor, P.G. (1948). *Forgotten Island* – Frontispiece.

Despite Taylor being effectively sidelined, his idea was adopted by President Roosevelt in September 1943. Roosevelt authorised a Naval survey to Clipperton Island, which was conducted by Rear Admiral Richard Byrd, and included representatives of six American airlines. The survey unsurprisingly ascertained that Taylor's plans had merit. Meanwhile, undeterred, Taylor had finally gained approval from the UK's Air Ministry to conduct his survey flight to Clipperton Island, with scant regard for the Americans' assumed disapproval. Admiral Ernest King from the US Navy, after much prevarication, relented and tentatively approved the survey flight in August 1944. Observations by Taylor in his book *Forgotten Island* summarise the reasons behind this exploratory flight. They are indicative of the ongoing evolution of commercial aviation and also supportive of the changing role of flying boats:

To summarise now the full purpose of this flight:

This was of course to discover whether a route by the South Pacific to New Zealand and Australia could be developed, and to select Islands and sites upon them which would be suitable as bases for sea and land aircraft, at

intervals which would divide the route into flight stages which could be flown by existing types.

To observe and record meteorological conditions and their influence upon the passage of aircraft this way.

To investigate health and medical aspects of the places visited so that these could be taken into account and allowed for in the life of the staffs of the bases and crews and passengers passing through.

To examine and record the natural resources of these places and Islands relevant to their use in the establishment and maintenance of the bases

To report upon anything likely to influence the future use of this region as an airway (Taylor, 1948, p.41).

The importance of these aims should not be disregarded, as they demonstrate the extent to which the development of commercial aviation remained in its infancy, in particular in the far-flung dominions of the British Empire.

The foregoing narrative also indicates that politics and post-war commercial aviation imperatives remained inextricably intertwined for the flying boats. Taylor's successful completion of this pioneering journey occurred on 30 October 1944 (Taylor, 1948). However, it quickly became embroiled in further politics when Roosevelt pressured Churchill to desist from any further development of the air route. Churchill had little choice but to comply with Washington, since the USA had effectively garrisoned Clipperton Island by 'dispatching an armed weather reporting party ... to pre-empt any further work by Britain' (Day, 1992, p.247). Sadly, this historic pioneering flight was accomplished by one of Australia's most accomplished airman and his crew to virtually no public acclaim or recognition of its true significance. The protectionist nature of the USA's political and commercial interests remained manifestly strong, even under wartime conditions.

### *Mariners and Lend Lease*

In the short space of five months following the attack on Pearl Harbour, the Japanese advanced relentlessly across Asia. By 1942, occupying Burma, Thailand, Malaya, Singapore, Borneo, Java, Timor and the Philippines, and firmly entrenching themselves on the north coast of New Guinea. Port Moresby was clearly in their list of future acquisitions. This would provide the Japanese forces with a convenient platform for further attacks on the Australian mainland (Monkton, 2002).

Alarmed at the unrelenting Japanese movement through the regions to the country's north, in April 1942 the Australian Government decided to expand the RAAF from 32 squadrons to 73 Squadrons (Graham, 2003). To this end Evatt was dispatched on a mission

to the UK and the USA to seek additional aircraft to bolster the RAAF's limited numbers. The UK Prime Minister Winston Churchill was ill-disposed to Evatt's request for one squadron each of Lancaster Bombers, Sunderlands and Spitfires. Churchill wished to prioritise his 'Germany First' campaign and disagreed with Curtin and Evatt on the imminence of the Japanese threat to Australia. He consistently rebuffed Australia's request and Evatt was instead obliged to seek an elevated commitment of aircraft from the USA (Day, 1992). General MacArthur, the Allied Supreme Commander for the South West Pacific Area, added his endorsement to Evatt's request. Roosevelt's administration, however, was disinclined to favour MacArthur's recommendation, as 'MacArthur was regarded with suspicion and even enmity in Washington where his Republican credentials were not appreciated by the Democratic administration of Franklin Roosevelt' (Day, 1992, p.7).

A compromise was reached soon after, which would have important implications for flying boats in Australia's military history. In August 1942, Churchill and Roosevelt were colluding to obstruct the withdrawal of Australia's well-regarded 9<sup>th</sup> Division from El Alamein. Curtin believed that this battle-hardened division was required in New Guinea to prevent the Japanese advance. In lieu of the 9<sup>th</sup> Division's return, a third American division was instead dispatched to Australia from the USA. The RAAF were also granted 475 US aircraft to assist in its defence against the Japanese. These aircraft were provided under the Lend Lease program 'in addition to previous regular allocations to the RAAF' (Graham, 2003, p.2). Not everyone was enamoured with the outcome of Evatt's lobbying. Australia's Air Adviser in Washington, Air Marshall Williams, warned that 'Australia would receive a numerically strong force, but one so ill-balanced that it would hardly be able to project its power over the continent, let alone over the adjacent Pacific' (Day, 1992, p. 132). This same parcel of aircraft had been rejected by both the RAF and USAAF, as being unsuitable to wartime demands. They included 12 A70 Martin Mariner I (PBM-3S versions) long-range, all metal, flying boats (Figure 28). It was hoped that these aircraft would help to secure the Australian supply lines threatened by the Japanese presence in the nearby region (Wright, 2015).

Despite the high hopes for the new flying boats, a number of issues emerged. The transports were delivered without armament or search radar and had to be modified for the personnel and freight tasks they were required to conduct. Despite this, they provided long range support for the RAAF during their island-hopping campaigns against the Japanese. 'The Mariners operated in conjunction with the Sunderlands' of No 40 Squadron, and superseded the Empire Flying Boats and Dorniers in No 41 Squadron' (Graham, 2003, p.1).



Figure 31: Martin Mariner A70-8, RAAF 41 Squadron, Townsville, 1944

Source: ADF Serials Image Gallery. Album A70-8. Photograph courtesy Mike Mirkovic.

These twelve Mariner aircraft possessed a number of characteristics that set them apart from the earlier models of flying boats. Mariners had an impressive range of over 2,500 miles and could accommodate more than forty passengers in spacious compartments. This was in addition to their freight carrying capabilities, and large cargo loading doors. (Wright, 2015). Initially regarded as being a substantial improvement over both the Empires and Dorniers, the Mariners also displayed some negative characteristics. Criticisms focused on their poor single engine performance, in particular at their maximum weights. In addition, they were known to be difficult to handle in rough seas (Monkton, 2002). Despite this, their contribution as a general support aircraft over a short operational life span remains significant.

The history of these aircraft reveals the significance of the Australian Government's political manoeuvring in order to obtain aircraft under wartime conditions. More importantly, the disbursement of the 475 aircraft allocated to Australia under the Lend Lease program illustrates vividly the increasing marginalisation of seaplanes compared to land-based aircraft. Of the 475 aircraft listed, only 24 were flying boats. The recommendations made in 1929 by the RAAF's first Chief of Air Staff, Sir Richard Williams, could no longer be ignored.

### *Return of the POWs on Catalinas*

The Japanese 'Instrument of Surrender' was signed in Tokyo Bay at 09.04 hours on 2 September 1945 ('Surrender Sign by Japan', *The Courier Mail*, Brisbane, September 3 1945, p.1). In preparation for this event, eight RAAF Catalinas had departed Darwin on 31 August 1945 carrying medical stores and records. Also on board several of the aircraft were personnel who constituted what became known as the 'Prisoners of War Reception Group' (Wicks, 2000). The Catalinas arrived at Brunei Bay in Labuan on 1 September 1945, where they awaited formal instructions prior to proceeding to Singapore to assist in the repatriation of Allied prisoners of war (POWs). These orders were received in the early hours of 9 September 1945, and the task force departed Labuan at 09.50 hrs. After a flight of 7 hours and 45 minutes, the group landed in the straits adjacent to Singapore Island and immediately proceeded to Changi prison to locate and assist the POWs. One of these Catalinas was under the command of Flight Lieutenant Bern Baker. After the authorities had determined which of the POWs were medically fit to fly, Baker commenced the homeward journey on 12 September 1945. The remaining seven Catalinas departed the same day, with similar allotments of six crew and 17 POWs. Each aircraft was equipped with four bunks, one toilet and a small electric stove and with 23 people on board. As a result, hygiene was not good (Wicks, 2000).

Due to the unknown reaction to flight by the POWs, the journey was staged with nightly stopovers in Labuan, Darwin, Cairns and then directly to Sydney. The eight Catalinas arrived at Rose Bay on Sunday 16 September 1945, to be greeted by a flotilla of yachts, ferries and small craft that lined the alighting area (Gaunt and Cleworth, 2000). The POWs were transferred onto launches, which then proceeded through the welcoming flotilla to the original flying boat base. Up to 50,000 onlookers were present at Lyne Park in Rose Bay, and the returning 135 POWs were treated to a hero's welcome:

As these men of the 8<sup>th</sup> Division stepped from their aircraft no human noise ever surged over the harbour like that which swept out from the shore to greet the first men ... freed at last from the long captivity as they came home ... (McKernan, 2000, p.3).

Figures maintained by Dr. George Gibson, who was an Assistant Director Medical Services for the Australian Prisoner of War Reception Group, indicate that a total of 13,428 Allied personnel were repatriated from Singapore, of which only 1,244 were evacuated by air. The majority of personnel returned to Australia on hospital ships, as it was determined that the relatively quick air journey could be detrimental to the POWs' health (Vincent, 1978). Nonetheless, the role of the flying boats in repatriating the first and most urgent cases remains historically significant.

## *Conclusion*

Flying boats were not discarded during the wartime period but were repurposed. Aircraft such as the Short S23 C Class Empire flying boats shifted from having a commercial role to being a utilitarian military plane. Such aircraft provided an essential service in the transporting of military personnel and supplies, and in the surveillance of Australia's coasts. Crucial to the aircraft and their crews was the supporting defence infrastructure, such as the largest flying boat base in the southern hemisphere at Rathmines RAAF Air Base at Lake Macquarie. The efficient operations of these maritime bases in providing services such as training, maintenance, fuel and accommodation were essential to the mainstream operations.

The fall of Singapore to the invading forces of Japan was a critical test of Australia's sense of imperial connectivity. Based on poor and under-resourced defence planning, the UK was prepared to sacrifice South East Asia in order to prioritise the conflict in Europe. As a result, Australian strategies and allegiances became reliant on American intervention in the region, with long-term implications for the future of Australian aviation.

The Catalinas proved to be as indispensable for Australia's defence as the Spitfire was for the UK's. Civilian crewed Catalinas also restored the link between the UK and Australia, re-establishing crucial communications and connections between the imperial metropolis and its dominion. Arguably as important as this strategic function, the flights of 'The Secret Order of the Double Sunrise' were a psychological victory for both the planners and its operators.



Figure 32: Short Sandringham S25 Beachcomber, in Ansett Flying Boat Services livery, Southampton Hall of Aviation, UK 2014

Source: Author's Collection. This aircraft was originally a Sunderland Mk III built in 1943 and converted to a Sandringham in 1947 for Tasman Empire Airways Ltd. (TEAL)



## Chapter 7: Reflections and Conclusions

Australia's vast coastline and myriad waterways provided the opportunity for flying boats to be used to explore natural resources and advance the interests of commerce. The evolution of aviation in the United Kingdom (UK) and its colonies was initially governed by bureaucratic concepts based on the country's historic maritime traditions, which consequently favoured the development of flying boats for long distance travel. This prevailing attitude derived from under-researched, but nonetheless influential government control, manifested through mail subsidies. Experimental airmail services provided the impetus for the creation and implementation of the short-lived EAMS, which had a significant influence in the establishment of the flying boat era. Not least, EAMS spawned the development of the Short Empire C Class flying boat, which was to revolutionise luxury air travel.

The pre-war presence of flying boats in Australia had been limited to visiting RAF aircraft, European exercises in patriotic propaganda, and a small contingent of RAAF float planes. Australia's vast coastline made it ideally suited to the use of flying boats, as demonstrated by the early RAAF aerial surveys of Australia and its neighbouring regions. These pioneering exploratory flights enabled visionary people to recognise the viability and potential of travel by flying boat. The RAF also demonstrated flying boats' effectiveness and reliability for long distance air travel that paved the way for comparable civilian routes. This newfound knowledge was exemplified with the birth of Imperial Airways and the introduction of EAMS, whose prime purpose as an email service was the connection and control of the UK's global empire through civil aviation.

Significant changes in aviation technology were experienced following the introduction of the Short S23 Empire C Class flying boat. Built principally for the carriage of mail and some passengers, these were also among the first large all metal aircraft offering the safety of four engines, autopilot, in-flight service and promenade decks. The overall performance of the C Class, which included higher cruise speeds and a longer range than previous aircraft, resulted in a significant reduction in time in the journey from the UK to Australia. Journeys that previously took twelve and a half days could now be accomplished in nine and a half days, and Australia was host to the longest scheduled international air service in the world. These Flying Boats represented the epitome of luxury, on a scale not previously seen in long distance air travel.

Major advances in aircraft design and performance occurred in parallel with the commercial expansion of EAMS. From the very first C Class flight in July 1938, mail loads continued to break records and in the first nine months of operations, more mail had been

carried than in the previous four and a half years. By September 1938, one year after EAMS' commenced, Australia had already reaped the benefits of this scheme with over 4,900 passengers carried and 426 tons of mail having been transported. EAMS was considered 'Britain's most significant civil aviation initiative of the 1930s (Ewer, 2007, p. 1). Even at this early stage of aviation development, the socio-economic implications of long haul air travel for Australia were clear.

As the possibility of a European war loomed, the Australian Government sanctioned a pioneering flight across the Indian Ocean, under the command of the famous Australian aviator P. G. Taylor. This successful flight in a Catalina PBY aircraft in June 1939, across the second last of the world's oceans to be crossed by air, conclusively demonstrated the value of flying boats.

Despite the far-sightedness of its underlying concept, EAMS' operation proved problematic and there were major accidents resulting in hull losses (although not losses of people). By the start of World War II, the UK government's over-reliance on flying boats was beginning to cause embarrassment, and EAMS was suspended. Australia had been a major beneficiary of the scheme during the 14 months of its operation though, which had consolidated the value of a scheduled international air service and an inexpensive fast airmail service from London. However, the practical approach EAMS seemed to offer to Australia's position in the network of imperial aviation was overturned by shifting political considerations in London. The EAMS program had been the cornerstone of the UK's attempt to dominate Australian aviation but failed due to poor planning and the choice of aircraft. The program's collapse upon the onset of World War II ushered in the opportunity for Australia's use of more advanced American technologies. The Australian government began to realise the utility and future application of landplanes.

The RAAF's decision to rely on the Catalina for maritime reconnaissance of the Australian coastline during World War II cemented that aircraft's place at the centre of Australia's aviation history. The initial delivery flight from the USA to Australia in itself provided invaluable navigational data and was only the third flight across the Pacific. Further, the exposure of Qantas Empire Airways personnel to the American aircraft industry when taking delivery of the first Catalina fleet proved instrumental in the selection of new aircraft types for post-war QEA. In the later war years, the civilian crews of QEA flying unarmed Catalinas provided substantial support for the overall security of Australia by reconnecting the Horseshoe Route air link from Australia to the UK. Flying a route across the Indian Ocean via Ceylon, QEA gave its passengers a certificate as members of the 'Secret Order of the Double Sunrise'. These QEA Catalina crews initiated the longest nonstop regular passenger air

service in the world. In the process, they broke the Japanese air blockade between the Asia-Pacific region and Europe.

While it became clear even before World War II that the future of Australian aviation would lie largely with land based planes, I am strongly of the view that there were two principal legacies of the flying boat era for the contemporary period. The first was the consolidation of scheduled international air services between the UK and Australasia, employing the Short C Class flying boats that provided a level of luxury not previously experienced in any form of air travel in Australia. The second, equally important legacy, was the arrival of the Catalina PBY on Australian shores. This aircraft demonstrated from its outset that long distance air travel could be undertaken through a safe and regular service. This was ably demonstrated by QEA's Indian Ocean transits. Between them, the C Class and the Catalina aircraft and their derivatives strongly confirmed for the Australian public the genuine potential to overcome the barriers apparently presented earlier by long distances, lack of safety and comfort of aeroplanes. While the war saw combat tragedies involving these aircraft, the public maintained their enthusiasm for the future of long-distance air travel. The large, multi-engined, spacious flying boats and the impeccable safety record of Qantas itself strongly encouraged air-mindedness among Australians.

This thesis establishes that, from its beginnings, the flying boat era was both a catalyst and a fundamental component in the development of aviation technology and awareness in Australia. The technological changes that accompanied the introduction of the Short C Class Empire flying boat became the benchmark for derivatives of that class and for the next generation of aircraft. From that same C Class concept, the various marks of Sunderland evolved, which in turn became the mainstay of flying boat operations within Australasia. Ably supplemented by the American-designed Catalina, these three aircraft created a demand for both domestic and international travel not previously experienced in Australia. That development of international travel transformed the cultural life of Australia. While the future of Australian air travel would not continue to be shaped by flying boats, there is no question that they made a very major contribution to making that future possible.

## Bibliography

- 'Air Force', *The Sydney Morning Herald*, October 8 1928, p.11 (NLA, NSW: 1842–1954)  
Retrieved February 26, 2018, from <http://nla.gov.au/news-article16499793>
- Airliners.Net. (2005, May) *Air NZ – 65 Years of Trans-Tasman Flying*. Civil Aviation.  
Retrieved November 16, 2012, from [http://www.airliners.net/aviationforums/general\\_aviation/read.main/2087061/](http://www.airliners.net/aviationforums/general_aviation/read.main/2087061/)
- 'Air Tragedy in Victoria', *The Sydney Morning Herald*, January 7, 1930, p.11 (NLA, NSW: 1842–1954). Retrieved February 26, 2018, from <http://nla.gov.au/nla.news-article16615843>
- Air New Zealand, *History*, Retrieved September 26, 2015, from <http://airnewzealand.com.au>
- Fleet Air Arm Association of Australia, 'Albatross Hoisting Seagull III' in *Our Heritage: RAN Naval Aviation 1913-1947*. Retrieved February 20, 2018, from <http://faaaa.asn.au>
- Australian War Memorial, 'Supermarine Southampton'. Retrieved September 30, 2012, from [http://www.awm.gov.au/units/subject\\_652.asp](http://www.awm.gov.au/units/subject_652.asp)
- 'Aviation - Inspector General's Report', *The Sydney Morning Herald*, May 21 1914, p.10 (NLA, NSW: 1842–1954). Retrieved December 12, 2017, from <http://nla.gov.au/nla.news-article15509534>
- Australian Aviation Hall of Fame, 'Sir Lawrence James Wackett', Retrieved March 5, 2016, from <http://aahof.com.au>
- Baldwyn. J.P. and Kriendler, J. (2011) *Pan American World Airways: History Through the Words of its People*. Retrieved October 24, 2016, from <http://www.panam.org/pan-am-world-airways>
- Bennett-Bremner, E. (1944) *Front-Line Airline*. Sydney: Angus and Robertson
- Bingham, J. (1983) *The Beckoning Horizon*. Ringwood: Penguin
- Blainey, G. (1966) *The Tyranny of Distance: How Distance Shaped Australia's History*. Sydney: Pan Macmillan.
- Bowyer, C. (1989) *The Short Sunderland*. Bucks, United Kingdom: Aston Publications
- Brooke, M. (2006) *Air Force History: Flying boats sail the skies*. Retrieved from <http://www.defence.gov.au/raafnews/editions/4802/history/story01.htm>
- Byrnes, P. (2000) *Qantas By George: The remarkable story of George Roberts*. Sydney: Watermark Press.
- 'Capt. P. G. Taylor To Fly Indian Ocean: Pioneer Survey for Government' *Courier Mail*, Brisbane, March 29, 1939. Retrieved November 1, 2012, from <http://trove.nla.gov.au/ndp/del/article/39009139>
- Campbell-Wright, S. (2014) *An Interesting Point: A History of Military Aviation at Point Cook 1914 - 2014*. Canberra: Air Power Development Centre

- Cassidy, B. (1996) *Flying Empires: Short 'C' class Empire flying boats*. Bath: Queens Parade Press.
- Cassidy, B. (2013) *Empire Flying Boat 1936–1947 (Short S.23 'C' class)*. Sparkford, Yeovil: Haynes Publishing.
- Charland, C. (2006) 'G Class Flying Boat 10 SQN RAAF' *Royal Air Force Commands*. Retrieved April 7, 2016, from <http://www.rafcommands.com/archive/09453.php>
- Clark, C. (2012) 'RAAF Support for An Australian Maritime Strategy Before World War II'. Retrieved March 23, 2016, from <http://airpower.airforce.gov.au>
- Clark, C. (2012). 'The RAAF at Sea before World War II', *Military History and Heritage Victoria Inc.* Retrieved September 26, 2012, from [http://mhhv.org.au/?p=2029&utm\\_source=rss&utm\\_medium=rss&utm\\_campaign=the-aaaf-at-sea-before-world-war-ii](http://mhhv.org.au/?p=2029&utm_source=rss&utm_medium=rss&utm_campaign=the-aaaf-at-sea-before-world-war-ii)
- Cobham, A.J. Sir (1926) *Australia and Back*. London: A and C Black
- Coyle, T. (2010) 'Round Australia in a Fairey Seaplane. The Adventures of Wing Commander Goble and Flight Lieutenant McIntyre on Their Pioneering Flight in 1924', *Headmark*, No. 135, March 2010, 59-65. Retrieved March 26, 2016, from <http://search.informit.com.au/documentSummary;dn=072986330032390;res=IELAPA>ISSN: 1833-6531>
- 'Coriolanus Journey Log books, 1948', *Qantas Heritage Collection*, Sydney Airport T3. Viewed 25 November 2015.
- Corn, J.J. (1983) *The Winged Gospel: America's Romance with Aviation, 1900-1950*. New York: Oxford University Press
- Cowan, B. (2013) *RAAF Short S.26 'G Class' 10 Sqn, RAAF*. ADF Serials. Australian and New Zealand Military Aircraft Serials and History. Retrieved April 7, 2016, from <http://www.adf-serials.com.au/ShortS26.htm>
- Crick, D. and Barr, J. (2015) *RAAF Supermarine Seagull V and Walrus*. ADF Serials. Australian and New Zealand Military Aircraft Serials and History. Retrieved April 30, 2015, from <http://www.adf-serials.com.au/2a2.htm>
- Crick, D. and Cowan, B. (2013) *RAAF A11 Supermarine Southampton 1*. ADF Serials. Australian and New Zealand Military Aircraft Serials and History. Retrieved January 21, 2014, from <http://www.adf-serials.com/1a11.htm>
- Crick, D. and Cowan, B. (2013) *RAAF Wackett Widgeon I and II*. ADF Serials. Australian and New Zealand Military Aircraft Serials and History. Retrieved October 3, 2015, from <http://www.adf-serials.com.au/widgeon.htm>
- Cruddas, C. (2006) *Highways to The Empire: Long Distance Flying Between The Wars*. Kent: Air-Britain (Historians) Ltd.
- Day, D. (1992) *Reluctant Nation: Australia and the allied defeat of Japan 1942-45*. Melbourne: Oxford University Press
- 'De Pinedo's Milestone Flights: Australia – Japan – America'. Retrieved March 19, 2018, from <http://italiausa.com/pinedo/dpmiles.htm>

- 'Departure From Melbourne' *The Brisbane Courier* July 17 1925, p. 14, (NLA, Qld:1864–1933). Retrieved February 2018, from <http://nla.gov.au/nla.news-article20943727>
- Doak, F. (1974). 'Early RAAF Feat Recalled', *RAAF News*, March
- Dunn, P. (2007) *Forced Landing of a Dornier DO-24K Flying Boat at Anna Plains, WA on 2/3 March 1942*. Retrieved May 20, 2015, from <http://www.ozatwar.com/ozcrashes/wa28.htm>
- Edgerton, D. (2013) *England and the Aeroplane: Militarism, Modernity and Machines*. London: Penguin
- Edmonds, L. (1993) 'How Australians were made airminded', *The Australian Journal of Media and Culture, Dependency/Space/Policy*, 7, 1-16
- Ellison, N. (1957) *Flying Matilda: Early Days in Australian Aviation*. Sydney: Angus and Robertson
- Evans, J. (1987) *The Sunderland: Flying Boat Queen*. Pembrokeshire: Paterchurch Publications
- Ewer, P. (2007) 'A gentleman's club in the clouds: Reassessing the Empire Air Mail Scheme 1933–1939', *The Journal of Transport History*. Retrieved from <http://journals.mup.man.ac.uk/cgi-bin/pdfdisp//MUPpdf/JTH/V28I1/280075.pdf>
- Fearon, P. (1985) 'The Growth of Aviation in Britain', *The Journal of Contemporary History*, 20 (1) January, 21-40
- Fiore, D. (2000) *The Lord of Distances: The life and deeds of Francesco de Pinedo*. Retrieved September 23, 2012, from <http://www.italystl.com/pinedo/index.htm>
- Fitzsimons, P. (2009) *Charles Kingsford Smith and those magnificent men*. Sydney: Harper Collins
- 'Flight of The Guba: Indian Ocean Survey', *The Telegraph*, Brisbane, August 4 1939, p.7, (NLA, Qld: 1872–1947). Retrieved February 19, 2018, from <http://nla.gov.au/nla.News-article 186292889>
- 'Flying Boat Base, *The West Australian*, Perth, August 16 1944, p.3 (NLA, WA: 1879–1954). Retrieved March 19, 2018, from <http://nla.gov.au/nla.news-article44819611>
- 'Flying Boat Cruise', *The Daily News*, Perth, June 1 1928, p.6 (NLA, WA: 1882– 1950). Retrieved March 19, 2018, from <http://nla.gov.au/nla.news-article79493748>
- 'Flying Boat Guba's Crew for Ocean Flight' *The Sydney Morning Herald*, May 17 1939, p.16. (NLA, NSW: 1842–1954). Retrieved February 19, 2018, from <http://nla.gov.au/nla.news-article1171270>
- 'Flying Boat Hangar at Rose Bay', *The Sydney Morning Herald*, July 18 1939 (NLA, NSW: 1842–1954), p. 13. December 18, 2017, from <http://nla.gov.au/nla.news-article17607095>
- Follett, N. (2017) 'The Arrivals', *Aviation Heritage*, 48 (1) 6-9.

- Frater, A. (1986) *Beyond The Blue Horizon: On the Track of Imperial Airways*. London: Picador.
- Fritzsche, P. (1993) 'Machine Dreams: Airmindedness and the Reinvention of Germany'. Retrieved November 9, 2016, from [http://www.jstor.org/stable/2167546?seq=1&cid=pdf-reference#references\\_tab\\_contents](http://www.jstor.org/stable/2167546?seq=1&cid=pdf-reference#references_tab_contents)
- Gaunt, C. and Cleworth, R. (2000) *Cats at War: The Story of RAAF Catalinas in the Asia-Pacific Theatre of War*. Sydney: Cleworth.
- Geale, B. and Cowan, B. (2013) *RAAF A9 Supermarine Seagull III*. ADF – Serials. Australian and New Zealand Military Aircraft Serials and History. Retrieved October 8, 2015, from <http://www.adf-serials.com.au/1a9.htm>
- Gehrmann, R. (2017) 'Service Personnel: Australian Experiences of Interculturality and Violence in British India' in Robert Mason ed., *Legacies of Violence: Rendering the Unspeakable Past in Australia*, 199-216. New York: Berhann Books,
- Gilbert, G. (n.d.) *The British Pacific Fleet*. Retrieved April 13, 2015, from <http://www.navy.gov.au/history/feature-histories/british-pacific-fleet>
- Goodall, G. (2014) *Douglas Dolphin in Australia*. Retrieved October 5, 2015, from <http://www.goodall.com.au/australian-aviation/dolphin/douglas-dolphin.htm>
- Graham, W.B. (2003) *RAAF Museum, Point Cook: A70 Martin Mariner*. Retrieved April 16, 2015, from <http://www.airforce.gov.au/raafmuseum/research/aircraft/series2/A70.htm>
- Graham, W.B. (2003) *RAAF Acquisition of 12 Martin PBM-3S Mariners*. ADF–Serials: Australian and New Zealand Military Aircraft Serials and History. Retrieved April 16, 2015, from: <http://www.adf-serials.com.au/research/raaf-pbm.htm>
- Grant, P. (2010) *The Airborne Sinews of Empire*. Retrieved December 17, 2010, from <http://www.bayourenaissanceman.blogspot.com.au>
- Grant, R. G. (2002) *Flight: 100 Years of Aviation*. London: Dorling Kindersle Ltd.
- Green, P. (1988) *Aircraft of the Royal Air Force 1939-1945: Short S.26 'G' Class Empire Flying Boat*. Imperial War Museums. Retrieved April 7, 2016, from <http://www.iwm.org.uk/collections/item/object/205127083>
- Gretton, R. (2002) *History of the Supermarine Seagull – V and Walrus*. Retrieved October 2, 2012, from <http://www.3squadron.org.au/subpages/Walrus.htm>
- 'Guba Lands at Port Headland', *Northern Star*, Lismore, June 5 1939, p.7 (NLA, NSW: 1876-1954). Retrieved March 19, 2018, from <http://nla.gov.au.news-article98579474>
- Guillatt, R. and Hohnen, P. (2010) *The Wolf: The Mystery Raider that Terrorized the Seas during World War I*. New York: Free Press
- Gunn, J. (1985) *The Defeat of Distance: Qantas 1919-1939*. St. Lucia: University of Queensland Press
- Gunn, J. (1987) *Challenging Horizons: Qantas 1939-1954*. St. Lucia: University of Queensland Press

- Gunn, J. (1988) *High Corridors: Qantas 1954-1970*. St. Lucia: University of Queensland Press
- Gunn, J. (1999) *Contested Skies: Trans-Australia Airlines, Australian Airlines 1946-1992*. St. Lucia: University of Queensland Press
- Harrison, P., Lockstone, B., and Anderson, A. (1997) *The Golden Age of New Zealand Flying Boats*. Auckland: Random House.
- Harwood, T. (2015) *Qantas Double Sunrise*. Retrieved March 20, 2016, from <http://www.qfom.com.au>
- Herington, J. (1954) *Australia in the War of 1939-1945*. Adelaide: The Advertiser Printing
- Higham, R. (1960) *Britain's Imperial Air Routes 1918-1939*. Oxford: Fonthill Media
- Holman, B. (2012) *Airminded: Airpower and British Society, 1908-1941*. Retrieved April 16, 2017, from <https://airminded.org/biographies/claude-grahame-white/>
- Holman, B. (2013) 'Dreaming War: Airmindedness and the Australian mystery aeroplane scare of 1918', *History Australia*, 10 (2) August, 180-201. Retrieved November 5, 2016, <http://search.informit.com.au/documentSummary:dn=704820587418539:res=IELAPA>ISSN:1449-0854>
- Horden, L. (1985) *Children of One Family*. Sydney: Retford Press
- Hudson Fysh, W. H. (1968) *Qantas At War*. Sydney: Angus and Robertson
- Hudson Fysh, W. H. (1965) *Qantas Rising*. Sydney: Angus and Robertson
- Hudson Fysh, W. H. (1980) *Wings to The World: The Story of Qantas 1945-1966*. Sydney: Angus and Robertson
- 'Indian Ocean Air Hop', *Townsville Daily Bulletin*, August 8 1944 p.3 (NLA, Qld: 1907-1954). Retrieved February 20, 2018, from <http://nla.gov.au/nla.news-article61931199>
- Isaacs, K. (1977) *First of the Line – HMAS Albatross, first aircraft carrier*, Naval Historical Society of Australia. Retrieved September 26, 2012, from <http://www.navyhistory.org.au/first-of-the-line---hmas-albatross-first-aircraft-carrier/>
- Isaacs, K. (1990) 'Taylor, Sir Patrick Gordon (1896-1966)', *Australian Dictionary of Biography*, National Centre of Biography, Australian National University. Retrieved January 30, 2013, from <http://adb.anu.edu.au/biography/taylor-sir-patrick-gordon-8763/text15357>
- 'Japs Attack Flying Boat', *Army News*, Darwin, February 5 1942, p.2 (NLA, NT: 1941-1946) Retrieved February 20, 2018, from <http://nla.gov.au/nla.news-article38328245>
- Jones, D. E. (2007) *Wings on the River*. Salisbury: Boolarong Press
- Jung, S. (2006) *Broome's World War II Flying Boats*. Retrieved December 6, 2012, from <http://www.museum.wa.gov.au/sites/default/files/Broome.pdf>
- Jung, S. (2008) *Australia's Undersea Aerial Armada: the aviation archaeology of World War II flying boats in Roebuck Bay, Broome, Western Australia*. Retrieved April 20, 2015, from [http://espace.cdu.edu.au/eserv/cdu:9264/Thesis\\_CDU\\_9264\\_Jung\\_S.pdf](http://espace.cdu.edu.au/eserv/cdu:9264/Thesis_CDU_9264_Jung_S.pdf)



- Kennedy, S. (2000) *The Croix de Feu: the Parti Social Francais, and the Politics of Aviation, 1931-1939*. Retrieved November 8, 2016, from <http://muse.jhu.edu.libraryproxy.griffith.edu.au/article/11854>
- Knott, R. (2011) *Flying Boats of the Empire: The Rise and Fall of the Ships of the Sky*. London: Robert Hale Ltd
- Lake Boga Flying Boat Museum, (2012) *The Flying Boat Museum*. Retrieved December 8, 2012, from <http://www.murrayriver.com.au/lake-boga-flying-boat-museum-980/>
- Lake, M. and Pratt, V. (2008) 'Blood Brothers. Racial Identification and the Right to Rule: the Australian Response to the Spanish-American War', *Australian Journal of Politics and History*, 54, 1:16-27.
- Lake Macquarie History, *Rathmines Air Base*. Retrieved April 13, 2015, from <http://history.lakemac.com.au/page-local-history.aspx?pid=1085&vid=20&tmpt=narrative&narid=3610>
- Lockey, T. (2014) *Australia's First Seaplane*, Aviation Historical Society of Australia (NSW) Inc. publication (Available from: Tom Lockey PO Box 301, Pymont, NSW, 2009, Australia)
- 'Lost Flying Boat', *The West Australian*, Perth, February 12 1942, p.4 (NLA, WA:1879-1954). Retrieved February 20, 2018, from <http://nla.gov.au/nla.news-article47180708>
- Lyth, P. (2000) 'The Empire's Airway: British Civil Aviation from 1919 to 1939', *Revue Belge de Philologie et D'histoire*, 78, 3: 3. Retrieved January 18, 2018, from [http://www.persee.fr/doc/rbph\\_0035-0818\\_2000\\_num\\_78\\_3\\_4469](http://www.persee.fr/doc/rbph_0035-0818_2000_num_78_3_4469)
- McKernan, M. (2000) 'War never ends' Fredrick Watson Fellowship Paper. Retrieved December 17, 2012, from [http://www.naa.gov.au/Images/McKernan\\_tcm16-35761.pdf](http://www.naa.gov.au/Images/McKernan_tcm16-35761.pdf)
- Milln, M. (2012). 'Significant Aviator Profiles: Flight Lieutenant Ivor Ewing McIntyre CBE AFC', *South Australian Aviation Museum*. Retrieved March, 27, 2016, from <http://saam.org.au>
- Ministry of Information (1946) *Merchant Airmen: The Air Ministry Account of British Civil Aviation 1939-1944*. London: HMSO
- Museum Victoria, 'Pratt and Whitney R-1830 Twin Wasp Aero Engine'. Retrieved May 8, 2015, from <http://museumvictoria.com.au/collections/themes/3628/pratt-witney-r-1830-twin-wasp-aero-engine>
- National Archives of Australia, 'Round Australia seaplane flight 1924: Wing Commander Goble and Flight Lieutenant McIntyre'. CA 46, Department of Defence (III), Central Office, B9376, 92.
- National Archives of Australia, Corcoran, L.G., Service No. 4503. A9300, Air Force Personnel Records, page 56 of 61. Retrieved April 7, 2016, from <http://recordsearch.naa.gov.au>
- National Archives of Australia, Madden, Gregory Mark, Service No. NX6942. B883. Retrieved March 22, 2016, from <http://recordsearch.naa.gov.au>
- National Naval Aviation Museum, 'PBY-5 Catalina'. Retrieved April 10, 2016, from <http://navalaviationmuseum.org>

- 'Launches to Serve Air Boat Bases'. *Courier Mail*, Brisbane, 3 January 1938 (NLA, Qld, 1933–1954) Retrieved April 28, 2016, from <http://www.trove.nla.gov.au>
- Neal, E.H. (1968) 'Long hop on the Kangaroo Route: Order of the Double Sunrise', *Wing Tips*, 7, (2): 24 – 42
- NSW Government, Office of Environment and Heritage (2008), *Rathmines Park, former RAAF Base*. Retrieved April 19, 2015, from <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5054666>
- Odgers, G. (1984) *The Royal Australian Air Force: An Illustrated History*. Sydney: Child and Henry
- Oliver, D. (1999) *Wings Over Water: A Chronicle of the Flying Boats and Amphibians of the Twentieth Century*. New Jersey: Chartwell Books
- 'Over the Ships: Flight with M. Guillaux' *The Sydney Morning Herald*, May 19 1914, p. 11 (NLA, NSW: 1842–1954). Retrieved December 9, 2017, from <http://nla.gov.au/nla.news-article15506914>
- Palmer, S. W. (2006) *Dictatorship of the Air: Aviation Culture and the Fate of Modern Russia*. New York: Cambridge University Press
- Parnell, N. and Boughton, T. (1988) *Flypast: A Record of Aviation in Australia*. Canberra: AGPS
- Piper, G. (2009) *Catalina Flying Memorial: Personal memories of RAAF Rathmines*. Retrieved from <http://www.catalinaflying.org.au/rathmines.htm>
- Pirie, G. (2004) 'Passenger traffic in the 1930s on British imperial air routes: refinement and revision'. Retrieved March 3, 2017, from [http://www.academia.edu/193274/Passenger\\_traffic\\_in\\_the\\_1930s\\_on\\_british\\_imperial\\_air\\_routes\\_refinement\\_and\\_revision](http://www.academia.edu/193274/Passenger_traffic_in_the_1930s_on_british_imperial_air_routes_refinement_and_revision)
- Powerhouse Museum (1951) *Catalina flying boat 'Frigate Bird' VH – ASA, 1935*. Retrieved from <http://www.powerhousemuseum.com/collection/database/?irn=207900>
- Powerhouse Museum Collection (2015) 'Aircraft model: Wackett's Widgeon II, (half model), 1926-1932' Search 2.53. Retrieved October 7, 2015, from <http://www.powerhousemuseum.com/collection/database/?m=237180>
- 'Purpose of The Flight', *The Age*, Melbourne, May 20 1924, p.10 (NLA, Vic: 1854–1954). Retrieved Jan 9, 2018, from <http://nla.gov.au/nla.news-article203643840>
- RAAF Museum, Point Cook, 'Fairey 111D'. Retrieved September 18, 2012, from <http://www.airforce.gov.au/raafmuseum/research/aircraft/series1/A10.htm>
- RAAF Museum, Point Cook, 'Supermarine Walrus HD 874'. Retrieved October 2, 2012, from [http://www.airforce.gov.au/raafmuseum/exhibitions/tech\\_hang/walrus.htm](http://www.airforce.gov.au/raafmuseum/exhibitions/tech_hang/walrus.htm)
- Rickard, J. (2012) *No. 107 Squadron (RAAF): Second World War*. Retrieved April 9, 2015, from [http://www.historyofwar.org/air/units/RAAF/107\\_wwII.html](http://www.historyofwar.org/air/units/RAAF/107_wwII.html)

- 'Rose Bay or Empire?' *The Sydney Morning Herald*, June 25 1937, p.10 (NLA, NSW: 1842–1954). Retrieved December 18, 2017, from <http://nla.gov.au/nla.news-article17387141>
- 'Round Australia.' *Daily Examiner*, Grafton, May 20 1924, p.5 (NLA, NSW: 1915–1954). Retrieved December 18, 2017, from <http://nla.gov.au/nla.news-article195374673>
- 'Archbold Expedition makes it Round-the-World', in *Round-the-World Flights*. Retrieved November 1, 2012, from <http://www.wingnet.org/rtw/RTW002MM.HTM>
- Royal Mail Group (2011) *Royal Mail celebrates 100 years of Aerial Post*. Retrieved April 14, 2017, from <http://www.royalmailgroup.com/cy/node/658>
- Sandilands, B. (2011) *Plane Talking: Some other parts of the Qantas story*. Retrieved November 24, 2013, from <http://blogs.crikey.com.au/planetalking/2011/07/21/some-other-other-parts-of-the-qantas-story/>
- Saunders, S. (2008). "'Wings Of Canvas": Early Flights in Papua New Guinea 1917 and 1920', *Rabaul Historical Society*. Retrieved September 20, 2012, from [http://historical-rabaul.blogspot.com.au/2008\\_07\\_01\\_archive.html](http://historical-rabaul.blogspot.com.au/2008_07_01_archive.html)
- Saxon, D. (2008) *Rathmines Air Force Base 1939–1960: A Brief History*. Retrieved from [http://www.rathminesbc.com.au/doc/Rathmines\\_Base\\_-\\_Brief\\_History\\_Revised\\_2011-High\\_Q\\_Print.pdf](http://www.rathminesbc.com.au/doc/Rathmines_Base_-_Brief_History_Revised_2011-High_Q_Print.pdf)
- Scott, J. (2013) 'Loops and Landings: Rose Bay Diary – Part 4'. Supplement to *Southern Skies*, The Newsletter of AHSA (NSW) Inc. No. 476, September
- 'Seaplane "Lands" In Yarra', *The Border Morning Mail and Riverina Times*, Albury, June 16 1920, p.2 (NLA, NSW: 1903-1920). Retrieved February 26, 2018, from <http://nla.gov.au/nla.news-article120588797>
- Searle, R. (2015) *The Man Who Saved Smithy*. Crows Nest: Allen and Unwin
- Senior, R. (2014) *The Double Sunrise Flight*. Retrieved May 9, 2015, from <http://www.returnofthecatalina.com/ebook/RexSeniorTheDoubleSunriseFlight.pdf>
- Senkus, W. M. (2007) 'A is for Airgraph: The Airgraph Services (17 April 1941 to 31 July 1945)'. Retrieved March 31, 2015 from [alphabetilately.org/airgraph.html](http://alphabetilately.org/airgraph.html)
- Sims, P. E. (2000) *Adventurous Empires: The Story of the Short Empire Flying Boats*. Shrewsbury: Airlife Publishing
- Spooner, S. (1927) 'The great flying boat cruise', *Flight*, 982, 732. Retrieved September 30, 2012, from <http://www.flightglobal.com/pdfarchive/view/1927/1927%20-%200807.html>
- Stackhouse, J. (1995). ... *From the Dawn of Aviation: The Qantas Story 1920 -1995*. Double Bay: Focus Publishing
- Sterling, C. (2003). Churchill and Air Travel. *Finest Hour* 118. Spring 2003. p. 24. Retrieved January 18, 2018, from <http://www.winstonchurchill.org>.
- Storr, A. (2006). Compilation by Alan Storr: 'RAAF WW2 Fatalities by Categories. RAAF Fatalities Serving in UK in 10SQN RAAF'. Retrieved April 10, 2016, from [http://www.awm.gov.au/images/collection/pdf/RC09125\\_003--1-.pdf](http://www.awm.gov.au/images/collection/pdf/RC09125_003--1-.pdf)

- Sturtivant, R. and Burrow, M. (1995) 'Supermarine Walrus (Supermarine Seagull)' in *Index of Naval Aircraft*. Retrieved April 30, 2015, from: <http://www.fleetairarmarchive.net>
- 'Submarines Shell Sydney and Newcastle' (1942, June 8). *Barrier Miner*, Broken Hill, June 8 1942, p.1 (NLA, NSW: 1888–1954). Retrieved February 22, 2018, from <http://nla.gov.au/nla.news-article48394749>
- 'Surrender Sign by Japan', *The Courier Mail*, Brisbane, September 3 1945, p.1 (NLA, Qld. 1933–1954). Retrieved March 19, 2018, from <http://nla.gov.au/nla.news-article50250626>
- Taylor, B. (1996) 'Naval Weaponry: Italy's MAS Torpedo Boats', *Historynet*. Retrieved April 18, 2016 from <http://www.historynet.com/naval-weaponry-italys-mas-torpedo-boats.htm>
- Taylor, P.G. (1948) *Forgotten Island*. Sydney: Shakespeare Head
- Taylor, P. G. (1953) *Frigate Bird*. Sydney: Angus and Robertson.
- 'Town Stunned by Sudden Attack', *The Advertiser*, Adelaide, February 23 1942, p.1 (NLA, SA: 1931–1954). Retrieved February 20 2018, from <http://nla.gov.au/nlanews-article48745629>
- 'Air Force' (1928,). *The Sydney Morning Herald*, October 8 1928, p.11 (NLA, NSW: 1842–1954). Retrieved February 26, 2018, from <http://nla.gov.au/news-article16499793>
- Vabre, P. (2014) 'Lost Without Trace?', *The Aviation Historian*, 9: 15-25.
- Vanhoenacker, M. (2015) 'In Flight. En route London to Tokyo: A pilot's eye-view of life in the sky'. Retrieved May 17, 2015, from <http://www.nytimes.com/interactive/2015/05/opinion/14-in-flight-mark-vanhoenacher.html?emc=eta1>
- Victoria University, Wellington, New Zealand, 'Who Wants Wellington to Be Better Connected? Tasman Traffic'. Retrieved September 26, 2015, from: <http://victoria.ac.nz>
- Vincent, D. (1978) *Catalina Chronicle: A History of RAAF Operations*. Adelaide: Paradise
- Walker, B. (2016). *General Francesco De Pinedo 1890 – 1933*. Retrieved March 20, 2018, from <https://captainbillywalker.com/aviation-history-people/2577>
- Wells, K. (2013) *Flying Boats in the Second World War, 1939-45*. Retrieved April 13, 2015 from <http://www.australia.gov.au/about-australia/australian-story/flying-boats-in-ww2>
- Wicks, G. (2000) 'Singapore and Return' in C. Gaunt and R. Cleworth eds, *Cats at War: The Story of RAAF Catalinas in the Asia-Pacific Theatre of War*. Sydney: Cleworth.
- 'Widgeon II', *The Sydney Morning Herald*, July 2 1928, p.12. (NLA, NSW: 1842–1954). Retrieved February 9, 2018, from <http://nla.gov.au/nla.news-article16476183>
- Williams, R. (1977) *These Are Facts: The Autobiography of Air Marshall Sir Richard Williams, KBE, CB, DSO*. Canberra: The Australian War Memorial and AGPS
- Williamson, K. (1996) *The Golden Age of Aviation*. New York: Robert M Tod

- Wilson, D.J. (2003) *The Eagle and The Albatross: The Struggle for Control of the Aerial Maritime Asset*. PhD Thesis, University of New South Wales. Retrieved September 20, 2012, from [unsworks.unsw.edu.au](http://unsworks.unsw.edu.au)
- Wohl, R. (2005) *The Spectacle of Flight: Aviation and the Western Imagination 1920-1950*. New Haven: Yale University Press.
- 'World of Wings', *The Telegraph*, Brisbane, July 12 1924, p.14 (NLA, Qld. :1872 -1947). Retrieved February 26, 2018, from <http://nla.gov.au/nla.news-article183999765>
- Wright, A. (2015) 'Australia's Forgotten Mariner', *Flightpath*, 27, (1): 55-58.
- Wynn, R. (2015) 'RAAF A 48 Vought – Sikorsky Kingfisher' *ADF–Serials, Australian and New Zealand Military Aircraft: serials and history*. Retrieved April 9, 2015. From <http://www.adf-serials.com.au/2a48.htm>
- Yell, S. and Fletcher, M. (2011) 'Airgraphs and an Airman: The role of airgraphs in World War II Family Correspondence', *History Australia*, 8, (3): 117–138