

Newsletter of the Australian Society for History of Engineering and Technology

Berejiklian government is reconsidering the future of Sydney's Powerhouse Museum



Powerhouse Museum at Ultimo

On 19 January 2017 NSW Premier Mike Baird announced his immediate retirement. Two days later Gladys Berejiklian was elected as leader of the NSW Liberal Party and the new state Premier. On 30 January she was sworn in as Premier and Don Harwin as Minister for the Arts and Vice-President of the Executive Council.

It came as no surprise that the Premier and the Minister are reconsidering the previously announced plan to move the Powerhouse Museum to Parramatta and sell the Ultimo site. In answer to a question in Parliament the Premier responded that Parramatta will have a Powerhouse Museum'.

On 19 April the Minister announced that public consultation would now take place for an extended business case that would examine options including the Powerhouse remaining partly or wholly in Ultimo along with expanded options for a new museum in Parramatta. In an interview on 20 April he said that the new museum in Parramatta will be world class, managed by MAAS and focus on science, technology, engineering design and mathematics. The final business case would now be released later this year.

Tanya Plibersek, Deputy Leader of the Federal Opposition and Labor Member for Sydney, conducted a media interview in Sydney on 23 April. She said 'I wanted to come out this morning ... to say how pleased we were to see yesterday that the State Government is now considering leaving the Powerhouse Museum right here, where it belongs, as well as building a first-class cultural facility for western Sydney. The people who support the Powerhouse Museum have never said that this museum should be at the expense of the people of western Sydney having a cultural institution of their own.'

The Upper House committee conducting an inquiry into museums and galleries held its seventh public session on 6 June with the Minister for the Arts Don Harwin as principal witness. It was announced that the committee would now present its final report by 25 August.

The Minister said that the Government had always been very clear that its proposal was that the Museum of Applied Arts and Sciences (MAAS) will be headquartered at Parramatta in a new world-class, iconic museum with a focus on science innovation. He understood that the original terms of reference for the business case precluded the option of any cultural space remaining at the Ultimo site. He had now recommended

to the Premier that the business case be extended to retaining all or part of the Ultimo site as cultural space and the Premier had accepted this recommendation.

It seems likely that the Upper House committee will be supportive of retaining the Powerhouse occupation of the present Ultimo site. But it seems clear that we will need to wait until at least late in 2017 for the government's decision on its future.

Ian Arthur

Book review: *Heyday, a fascinating book about Britain in the 1850s*

Wilson, Ben 2016, *Heyday : Britain and the birth of the modern world*, London Weidenfeld & Nicolson.

I picked this book up in the local library. It is a highly readable account by a prize-winning young historian of a decade, the 1850s, in which Britain was at the very centre of making the modern world. Innovations in technology played a vital role.

Wilson's story begins with gutta-percha, a natural latex from Malaya, that had been known in Britain for some twenty years, and was finding an ever-increasing number of applications, including rain-coats, golf balls and shoe soles. In 1851 it was shown to be the ideal insulator and casing for the telegraph cable that was being laid across the Channel. It was the first of the telegraph cables that spread across the developed world over the following years and which transformed international communications.

In the same year Britain built the prefabricated glass and iron Crystal Palace that housed the Great Exhibition, hailed by the *Illustrated London News* as 'the most remarkable event in the modern history of mankind'.

Wilson then switches to the British colony of Australia where in 1851 great discoveries of gold were being made at Ballarat, Bendigo and elsewhere. The wealth from the California gold rush had already exploded on its local economy, and the discoveries in Victoria now almost doubled global gold production.

In the following chapters Wilson covers a diverse range of mid-century events that would shape the modern world: opening of the American West; the Crimean War; the clash of American and British interests in the Caribbean; the spread of trade and conflicts involving Britain in China, Japan and India.

Wilson mentions the rising importance of the newspaper industry in which Britain was the world leader, assisted by the rapid development of telegraph communication and printing technology. Britain led the world cotton industry, assisted by important innovations in spinning and weaving and came close to armed conflict with the US over the issue of slavery.

Then near the end of the decade, on 24 November 1859 Darwin published *On the Origin of Species*. Wilson writes that 'aside from Karl Marx, no other thinker of the nineteenth century has such a hold on the twenty-first'

Altogether a remarkable decade, during which Britain was undoubtedly at the height of its power.

Footnote

An article in *The Economist* of 17 June 2017 reports the results of a new study of the GDPs of leading countries over the thousand year period up to 1850, by three economists Stephen Broadbury of Oxford University, Hanhui Guan of Peking University and David Daokui Li of Tsinghua ▶▶

Next ASHET events

Tuesday 5 September 2017

**Talk by Dr. Peter Hobbins, Department of History,
University of Sydney**

Flying the 'Southern Myth': pioneering flight simulation in Australia

In 1957, trainees at the Qantas Technical School in Sydney reported "scrounging around" to build a Lockheed Super Constellation. Christened the 'Southern Myth', it was not a flyable airliner, but rather a facsimile flight station "able to simulate practically any emergency that could arise". Knocked together from "scrap" components, circuits, plywood and paint, it was expected to train over 200 flight crew within 6 months.

Often overlooked in aviation history, from the 1930s flight simulators developed rapidly in technological complexity. Pioneered by compact servomechanical units such as the Link ANT-18 Trainer, by the late 1950s installations such as the Boeing 707 simulator were sophisticated systems at the vanguard of digital computing. As an aid to training, they reduced the human and financial costs of flight instruction, permitting both routine and emergency scenarios to be 'gamed' in safety – and under close supervision. As the automation of aircraft systems advanced, by the mid-1960s mastering a simulator was arguably more demanding than the majority of operational flights.

Surveying flight simulators in Australia from the late 1930s to the early 1970s, this talk pieces together their civilian and military uses in aircrew training and evaluation. Spanning the Link Celestial Navigation Trainer to the first Qantas Boeing 747 simulator, it considers their value in modelling aerodynamic, operational and psychological scenarios under Australian skies.

Dr Peter Hobbins is a historian of science, technology and medicine at the University of Sydney. He is currently researching aircraft crashes

and aviation safety systems in Australia up to 1970, and is a member of a forthcoming multi-institutional project exploring our civil aviation heritage since 1920. Peter is also a Research Fellow at the Civil Aviation Historical Society/Airways Museum in Melbourne.



CAHS/Airways Museum photo TAA Link Trainer, Airways Museum

Venue: History House, 133 Macquarie Street, Sydney

Time: 5.30 for 6 pm

Cost: Includes light refreshments on arrival; RAHS and ASHET members \$10, others \$12
Bookings: phone RAHS on (02) 9247 8001 or email history@rahs.org.au

More ASHET events

There will be ASHET-RAHS meetings at History House in July and September 2017, with the details yet to be confirmed. Details will be posted on the ASHET website <http://ashet.org.au/>, and will be emailed to ASHET members when they become available.

► University. It compares the GDP per persons of four countries, China, England, Holland Italy and Japan. It shows that the only period when China was richer than the others was during the 11th century, by which time China had invented gunpowder, the compass, movable type, paper money and the blast furnace. Around 1800 Japan overtook China as Asia's richest country.

China had been overtaken by Italy before 1300 and by Holland and England by the 14th century. From the mid 17th century the industrial revolution produced rapid growth in England's GDP per person, and by 1850 it was well ahead of the other European nations.

Ian Arthur

100 years ago: completion of the Transcontinental Railway

The railway, just over 1700 km long, between Port Augusta in South Australia and Kalgoorlie in Western Australia, was built from both ends, which met in the desert on 17 October 2017. The first train left Port Augusta at 9.30 am on Monday 22 October and arrived in Kalgoorlie at 2.50 pm on Wednesday 24 October. Because of the war there were no opening ceremonies. Commonwealth Railways was established in 1917 to administer the line.

The legislation to allow the survey for the line had been passed in 1907, and the survey was complete by 1909. Legislation authorising construction was passed in 1911 and construction commenced from Port Augusta in the following year. The line was standard gauge, even though the lines connecting to it at each end were narrow gauge. The entire route in standard gauge between Perth and the eastern states was not completed until 1970.

The line originally had 400 metre unattended crossing loops at intervals of approximately 100 km. As traffic increased they were extended

and more closely spaced until by 2008 they were at least 1,800 m. long and spaced at around 30 km.

The first locomotives to run on the line were Commonwealth Railways G class, similar to the NSW Railways P (later C32) class. Four were built by Clyde Engineering in Sydney and twelve by Baldwin Locomotive Works, Philadelphia, and delivered in 2014. A further ten were delivered by the Toowoomba Foundry in 1916 and 1917. Water for the engines made up around half the load of trains running on the original line. Between Port Augusta and Kalgoorlie the railway does not cross a single permanently running stream. Bores and reservoirs were established at intervals but their water was unsuitable for regular use in the locomotive boilers.

Diesel locomotives first ran on the line in 1952. Henry Deane, the railway's engineer-in-chief had wanted to operate the railway with diesel engines from the beginning, but this was an idea before its time and it was not until 1929 that diesel locomotives were in regular service on a main line anywhere in the world.

Ian Arthur



First train on the Trans arriving at Kalgoorlie on 24 October 1917

Time for a National Aviation Museum?

by Ian Arthur

The idea for a National Aviation Museum first gained prominence with the publication of the report *Museums in Australia 1975* (the Pigott Report), which was the outcome of a Committee of Inquiry established by the Whitlam government in April 1974. The report was wide-ranging. Among its key recommendations were that the Australian government should establish a Museum of Australia in Canberra that would focus on the history of man in Australia and the interaction of man and the Australian environment, along with no more than three other new national museums of which two should be given early priority. These should be a National Maritime Museum in Sydney, and a National Aviation Museum at a growth centre such as Albury-Wodonga.

Within a few days of the report's release the Whitlam government was dismissed and was replaced by the Fraser government, which established the Museum of Australia under the Museum of Australia Act 1980. The museum was opened on the site of the former Canberra Hospital in March 2001. The Hawke Government announced establishment of the National Maritime Museum in 1985 and it opened in Sydney in 1991.

But no Australian government has yet taken steps to establish the National Aviation Museum. This is not entirely surprising. Most of the principal exhibits in the new museum recommended by the Inquiry would need to be acquired from the existing museums in which they are on display. Most of these museums would be very reluctant to give up their important heritage items, on which in many cases they have invested resources, including thousands of hours of work by volunteers, in restoration and conservation. So the Inquiry's recommendation for a national aviation museum gained little support from the museum community, or from state governments.

There were of course some who hoped that their museum or their community could be the site of the new museum. This was particularly so in Victoria, where the Australian Aircraft Restoration Group, a volunteer organisation, has a museum at Moorabbin, a suburb of Melbourne, and around 50 aircraft, some of which badly needed protection from the weather. They were hopeful that their museum would be the one chosen as the site of the new national museum and adopted the name 'Australian National Aviation Museum' for their collection at Moorabbin. After years of discussions its management realised in the late 1980s that its only way to protect their aircraft was to sell all its surplus assets and build a hanger. It completed an 8,000 square foot hanger on its site and later extended it to 12,000 square feet, enabling it put around one third of its collection under cover.



Australian Aircraft Restoration Group museum at Moorabbin

At the time the Inquiry made its report there were several hundred aircraft of historic importance in around 50 collections around Australia. Many of the aircraft were in the care of volunteer groups, which made their best efforts to preserve and restore them. The resources of these groups were stretched to the limit and the establishment of a national aviation museum would be a step towards conserving at least the most significant items.

The Inquiry had also recommended that the Australian government establish a National Museums Commission that would assist it in the allocation of government funds to foster the development of museums gen-

erally throughout Australia. Successive governments have failed to adopt the recommendation to establish a Museums Commission, or to put any alternative support system in place.

The absence of a national policy for museums as recommended by the Pigott Committee was illustrated by the 1989 report published by the Commonwealth Department of Finance titled *What Price Heritage* that concluded that there should be no new Commonwealth museums, nor any assistance for national museums proposed by the states.

However in the 1990s an Australian government committee was formed to recommend where and how a National Aviation Museum should be established. The committee settled on a site at Point Cook, Victoria, next to the RAAF Museum which would cover the military side, while a new building would cover civil aviation. The whole project stalled because the major stakeholders could not agree on how to proceed.



RAAF Museum at Point Cook, Victoria

Since the establishment of the Australian Museum and the National Maritime Museum, there have been few other initiatives taken by the Australian government in the area of national museums. The situation up to 2011 is well summarised in a report by Des Griffin and Leon Paroissien titled *Understanding Museums: Australian Museums and Museology*, that is available on-line at <http://nma.gov.au/research/understanding-museums/index.html>.

However the idea of a National Aviation Museum is by no means dead.



Australian Army Flying Museum, Oakey, Queensland

The Aviation Museum National Network

In 2008 a group of Australian aviation museums from around Australia met at the South Australia Aviation Museum in Adelaide and resolved to form an organisation that would allow this group of non-profit volunteer museums to share each others experiences and to jointly further their common interest in aviation heritage. It decided to adopt membership of Museums Australia, the peak museums body in Australia, and within this organisation to form the Aviation Museums National Network (AMNN).

Its members have met annually at various locations across Australia. The criteria for membership of AMNN are that each member is a current member of Museums Australia and adopts its ethical standards, that it be a non-profit entity with a structure to support this and have an aviation collection of significance.

There are currently twelve members of AMNN, 5 in Victoria, 2 in each of NSW and Queensland and 1 in each of South Australia, Northern Territory and Western Australia. In December 2015 they had altogether nearly 2,000 volunteers, and two paid staff. Between them they had 142,000 visitors in a year. Together they have 214 major aircraft exhibits, with an estimated 43 of these being considered of national significance. In addition they have a large number of items of aviation memorabilia, photographs and technical manuals.

One of the museums, the Airways Museum at Essendon, a suburb of Melbourne, is different from the rest; it has no aircraft on display, but it has a collection of national importance illustrating the technology that supports aviation, including communications systems, air traffic control, navigation systems, and recording equipment such as the 'black box' an Australian invention.



Control panel from Mildura airport, at Airways Museum, Essendon

AMNN and its member museums maintain close relationships with the Aviation Historical Society of Australia, which takes a strong interest in museums and their potential for presenting the history of Australian aviation to a wide audience in an attractive way.

The AMNN member museums are currently working together to im-



Fighter plane restoration at Classic Fighter Museum, Adelaide

prove their conservation and display management. In addition they are compiling a register of significant items in all their collections using a rating system developed by the British Aviation Preservation Council, with which AMNN keeps in close touch.

Recent Developments

In 2015 Antony Grage (at that time President of the Aviation Historical Society of Australia and since deceased) presented a paper to the Aviation Cultures MkII conference held in Sydney, titled *The Need for a National Aerospace Museum*. He argued that in the 40 years since the Pigott Inquiry identified in one of its major recommendations the need for a National Aviation Museum there has been no significant change that would diminish that need. Ogden in his world-wide listing of aviation museums had identified 122 aviation museums in Australia with 1042 aircraft, and many special interest aviation groups and societies. Of the existing museums, the government funded ones, mostly managed by branches of the armed forces, had the best presented collections and best controlled policies. But many of the smaller museums, such as those in the AMNN held significant aeroplanes and their involvement would be crucial.



Ballarat Aviation Museum, Victoria

Grage argued that as the 129 aircraft that he had identified as desirably part of the national collection was too large a number to be accommodated on one museum site, the best solution would be to have these spread over the existing museums, with a new building housing 20 to 30 really significant ones, along with a national archive. Gage proposed that this National Aviation Museum building should be located near to one or more of the existing regional museums in a major city, so visitors would be able to see a fair proportion of significant Australian aeroplanes within a day.

Grage identified two of the most significant aircraft that must be included in the national collection: Keith and Ross Smith's Vickers Vimy, the first aircraft to enter Australia from overseas when it won the Federal Government's £10,000 prize, and Kingsford Smith's Focker *Southern Cross*, the first aircraft to fly the Pacific. Both of these aircraft are owned by the Australian government and are housed in their own buildings adjacent to airports in Adelaide and Brisbane respectively.

Grage described in his paper the first steps that would need to be taken to achieve the desired outcome. These would be to decide the basic policies, the most important being:

- Collection and Acquisitions Policy, covering Aircraft and Engines; Archives; Artefacts & Ephemera; Restoration; Education & Interaction.
- Exhibitions, Borrowing and Loans Policy, covering Rotating Exhibits; Reimbursement to Lenders.

Grage acknowledged that here were difficulties to overcome, notably the likely hostility of some of the existing museums to relinquishing their prized possessions, but argued that this need not be the case as there were

several possible solutions including exchanges, loans, rotating exhibitions and leasing.

In 2017, David Byrne, from the SA Aviation Museum, presented a paper to the next Aviation Cultures conference, taking up some of the issues raised in Grage's paper. In it he lists some of the reasons for the lack of progress towards establishing a National Aviation Museum. These are the lack of satisfactory answers to the questions of cost and who will fund the establishment and operating costs; location of the museum (which state will get the 'prize'); and the acknowledged difficulty of acquiring a collection of significant exhibits when the most important ones are already firmly located in one or another museum across Australia.

Byrne proposes in his paper an alternative approach based on designating as a national collection the items in the existing collections located in each state held by members of AMNN, under the auspices of a Federal National Museum office that would supervise governance, funding and conservation standards across the nation. The criteria for selection as part of this National Aviation Museum would be similar to those for membership of AMNN: an existing non-profit museum with a significant collection and open to the public.

Byrne identifies that the most basic need to bring about such a National Aviation Museum with its collection held in a number of locations across Australia would be financial support, that would almost certainly have to be mainly from the Australian government. Funding would be needed to improve the existing infrastructure to house and display the significant items, to provide for improving conservation and display, and to provide ongoing support for meeting staff and other costs. Also there would need to be the support of the state governments, and from one or more prominent individuals or organisations.

Once established this distributed national collection would be supervised by the Federal Department of Communication and Arts.

Byrne in his paper does not describe what are the next steps towards bringing about this desired outcome, a National Museum of Aviation with a distributed collection meeting high standards of conservation, display, interpretation and with the ongoing support of Australian and state governments. However it seems clear that he is expecting that the members of AMNN will take the first steps, and that among these will be getting the state and Australian governments on side with the idea.

The way forward

The vision that Byrne outlines, of a National Museum of Aviation consisting of a collection of the most significant items of Australian aviation heritage located in a number of existing museums, seems to be more capable of being achieved than the one described by Grage of a new building housing the 20 to 30 all the most important heritage items. But it involves a novel concept of what is a museum, and this concept will need to be accepted by a number of influential people, not least of these being the Australian Minister for the Arts and key staff in his Department.

What is a museum?

It is generally accepted that the essential feature of a museum is that it is a collection. In recent years we have become familiar with the idea that a museum may have its collection spread over more than one site, but the idea of a museum that is spread over 12 or more sites, as Byrne suggests for an Australian National Aviation Museum, is novel. However it is probably the most practical since there are just too many highly significant Australian aviation items for them to be conveniently accommodated on one site. There are also advantages in having the museum in several locations. It will reach a much larger number of visitors than if it is located in one place, and it will be practical way of involving many of the groups of volunteers who currently manage and care for the majority of Australia's significant items of aviation heritage.

In 2011 Andrew Sayers, then Director of the National Museum of Australia wrote an article titled *Redefine museums as educational resources* published in the Australian of 25 August 2011. He wrote:

'We need to redefine museums as educational resources rather than as buildings where collections are held. In fact, it is probably true to say that collections are seen by governments as more of a problem, the source of demands for ever-increasing storage facilities, rather than as the assets

they are. Arguments for collections have to be framed in terms of the social good inherent in using those collections. There are many ways in which the collections of Australia's museums could be deployed for great social return. Museum collections have already been effectively paid for by the taxpayer so unlocking the cultural value of these public assets, especially though digitisation, is a smart use of public funds.'

Australia's aviation museums are potentially important resources for furthering understanding of the nation's history, society and science. They now need to be effectively deployed towards these ends. The establishment of the nucleus of a National Aviation Museum as proposed by AMNN looks like the way forward and it merits our understanding and support.

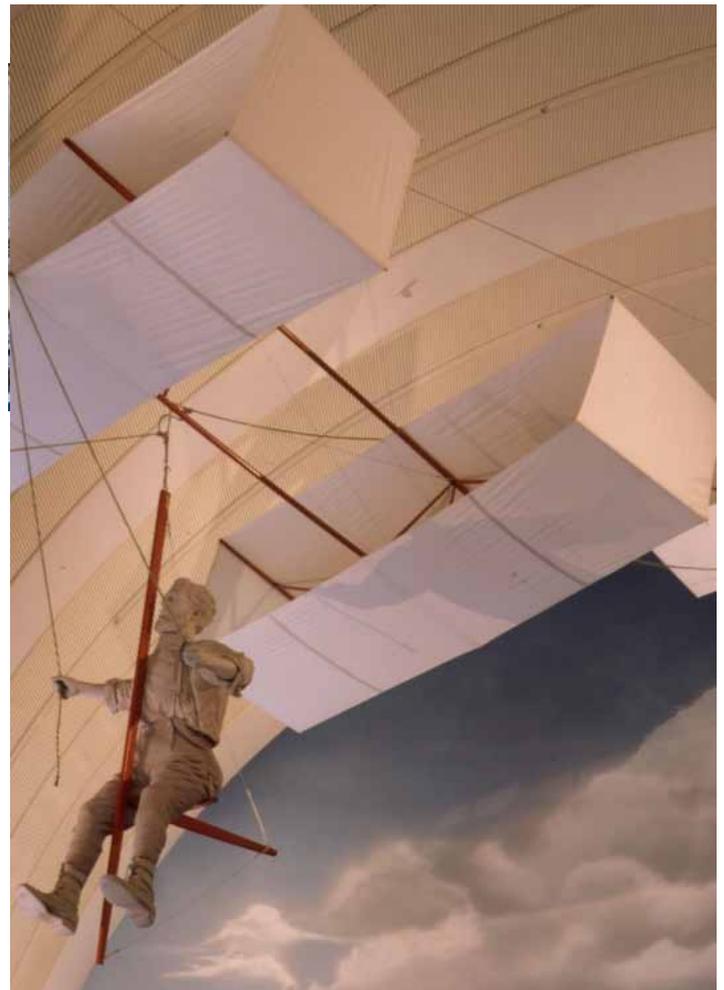
We will keep you informed on progress in future issues of ASHET

Australian museums' aviation collections

Australian museums together hold a remarkably comprehensive collection of items telling the story of aviation in Australia. A few of the highlights are mentioned here along with brief descriptions of the events that made them special.

Powerhouse Museum, Sydney

The Powerhouse Museum has the world's largest collection of items relating to the life and work of Lawrence Hargrave, an Australian pioneer of aviation. He is famous for his studies of aerodynamics and for two important inventions, a radial engine powered by compressed air, and the box kite which inspired the wing designs of the earliest French and German biplane designs.



Hargrave box kite replica at Powerhouse Museum, Sydney

The Powerhouse has on display several aircraft of historical importance, including the Catalina flying boat Frigate Bird II. The twin engine Catalina was the most successful flying boat ever produced.

Museum of Victoria

The museum in Melbourne has in its collection the aeroplane built at Mia Mia, Victoria, by John Robertson Duigan in 1909-1910, recognised as the first Australian designed and built aeroplane to successfully achieve controlled, powered flight. It is not currently on display.

Inspired by the flights of Wilbur Wright in France in 1908, Duigan built a Wright-type glider from a postcard photograph and managed to fly it in a strong wind tethered to 110 metres of fencing wire. Following this success, Duigan began work on a powered aircraft, which he first flew on 16 July 1910.



Duigan biplane when it was on display in Science Museum, Melbourne

Famous flights

In 1919 Keith Smith was the pilot and his brother Ross the navigator of the Vickers Vimy aircraft that flew from England to Australia in less than 30 days and won the £10,000 prize for being the first aviator to do so. The actual flying time was 135 hours.

Their aircraft is now owned by the Australian government and is on display at Adelaide Airport.

Charles Kingsford Smith was the pilot of the three engined Focke aircraft *Southern Cross* which he flew in 1928 with Charles Ulm and two American crewmen from Oakland, California to Brisbane. They completed the flight in under 84 hours flying time. He then flew the Southern Cross on a non-stop flight from Sydney to Perth and another flight from Sydney to Christchurch New Zealand to demonstrate the feasibility of passenger and mail services across the Tasman. He made several other notable long-distance flights.

Kingsford Smith's *Southern Cross* is now owned by the Australian government and is on display in its own purpose-built hanger near Brisbane Airport.



Southern Cross on display at Brisbane Airport

Point Cook RAAF Museum

The RAAF Museum is Australia's largest collection of military aircraft and memorabilia relating to the history of the Australian Flying Corps and the Royal Australian Air Force. The museum runs regular flying displays with some of its aircraft. The museum houses many historic aircraft and visitors can also view skilled aircraft restorers and maintainers at work.

The collection includes over 75 aircraft, 400,000 individual objects, 12,000 volumes and over 3 million negatives and photographs.

The Airways Museum at Essendon, Victoria

The Airways Museum collection had its origins in 1973 when it was realised that much airways equipment that had been in service since World War II, or before, was being replaced and would soon disappear altogether if not preserved. The purpose of the collection is to preserve for posterity examples of airways equipment which were once in common use. In doing so, the significant contribution of Australia over the years to the development of safe and reliable civil aviation is also highlighted.

The collection contains a number of Australian innovations and inventions that have led the world. It displays a comprehensive collection of the equipment that has been used for communications, control of services and safety on Australian airways.



Direction finder console at Airways Museum, Essendon, Victoria

Sources and further reading

Museums in Australia 1975, the Pigott report on museums and collections, is still relevant. On line at http://www.nma.gov.au/data/assets/pdf_file/000/000/Museums_in_Australia_1975_Pigott_Report.pdf

The papers by Antony Grage and David Byrne have not been published. If you would like copies of them email Ian Arthur on <mailto:ianarthur@ozemail.com.au> and he will send them to you.

The Aviation Museums National Network (AMNN) website contains links to the websites of the member museums and other websites of interest. It is on line at <http://australianaviationmuseum.com.au/aviation-museums-network.html>

Aerospace museums worldwide are listed by country including Australia in Wikipedia, with links to the individual museums, at https://en.wikipedia.org/wiki/List_of_aerospace_museums

The 2011 report by Des Griffin and Leon Paroissien titled *Understanding Museums: Australian Museums and Museology* provides useful background on museums in Australia that is available on-line at <http://nma.gov.au/research/understanding-museums/index.html>.

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