



**ROYAL  
AERONAUTICAL  
SOCIETY**  
AUSTRALIAN DIVISION  
SYDNEY BRANCH

**MARCH 2020**

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PO Box 573, Crows Nest, NSW 2020  
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<https://www.facebook.com/groups/RAeSSydney/>

**NEWSLETTER**



Title: **‘Aviation and the environment – gathering storm or golden opportunity?’**

Speaker: **Professor Ian Poll**

**OBE FREng FCGI Hon FAIAA FRAeS**

Date: **Thursday, 19<sup>th</sup> March, 2020**

Time: **18:00 for 18:30 hours (sharp)**

Venue: **Mechanical Engineering Theatre  
Mechanical Engineering Building  
University of Sydney**

Hosted by the Joint Board for Aerospace Engineering of Engineers  
Australia and the Royal Aeronautical Society Australian Division



Refreshments will be available prior to the commencement of the meeting. Attendance will attract 1.5 CPD hour

**Profile:** Ian Poll is Emeritus Professor of Aerospace Engineering at Cranfield University and CEO of Poll AeroSciences Ltd. A graduate of Imperial College, with over 40 years' experience in both the academic and the commercial domains, he is a former Head of the College of Aeronautics and has held senior academic posts at the Universities of Manchester and Cranfield. He has also founded two technology based companies; Flow Science Ltd. And Cranfield Aerospace Ltd. He was a member of the NATO AGARD Fluid Dynamics Panel (1990- 96) and has served on a number of UK Government Advisory Committees. He was Chairman of the Defence Scientific Advisory Council to the UK MoD (2011-14) and a member of the Home Office Scientific Advisory Committee and the Natural Environment Research Council (2014-18). Professor Poll has served on the Councils of the Royal Academy of Engineering and the Royal Aeronautical Society. He was the 74th RAeS President and is a past President of the International Council of the Aeronautical Sciences. He is an Honorary Fellow of the AIAA (2012) and ICAS (2012), a Fellow of the City and Guilds Institute of London (2004), the Royal Academy of Engineering (1996) and the Royal Aeronautical Society (1987) and was awarded the OBE in 2002.

**Synopsis:** Aviation facilitates and, in many cases, enables economic growth and social mobility at the global level. To support a growing global economy, air transport capacity must also increase. But how can this be done in a sustainable way when aviation currently uses fossil fuels and such an expansion could have consequences for the environment? In this lecture, Professor Ian Poll will explore how the chemical compounds found in jet engine emissions can affect the Earth's thermal radiation balance and the implications for global warming.

The impact of carbon dioxide is universally recognised. Less well known but potentially just as important are the aerosols, which under the right atmospheric and thermodynamic conditions, can lead to the formation of persistent contrails and, possibly, contrail induced, cirrus cloud.

Professor Poll will assess the current situation and examine the potential for improvements through design. He will also identify fuel wastage through the inefficient use of aircraft and the restrictions imposed by air traffic management. The evolution of the global air transport system over the next 30 years will be examined and the ways in which new technology may contribute to both improved aircraft efficiency and to the removal of waste will be outlined. Finally, brief consideration will be

given to the possible tactical use of global aviation to manage the Earth's radiation balance on a daily basis.

**Agenda: 18:00** Registration and refreshments  
**18:30** Welcome by Mr David Cox FRAeS, Chair of the Sydney Branch  
**18:35** Presentation by Professor Ian Poll FRAeS  
**19:30** Q&A **19:35** Supper



This evening is proudly Sponsored by

[Australian Society for Defence Engineering \(ASDE\)](#) is a technical society established by Engineers Australia in order to provide a forum to engage with various engineering fields and contribute to the practice of Defence engineering.

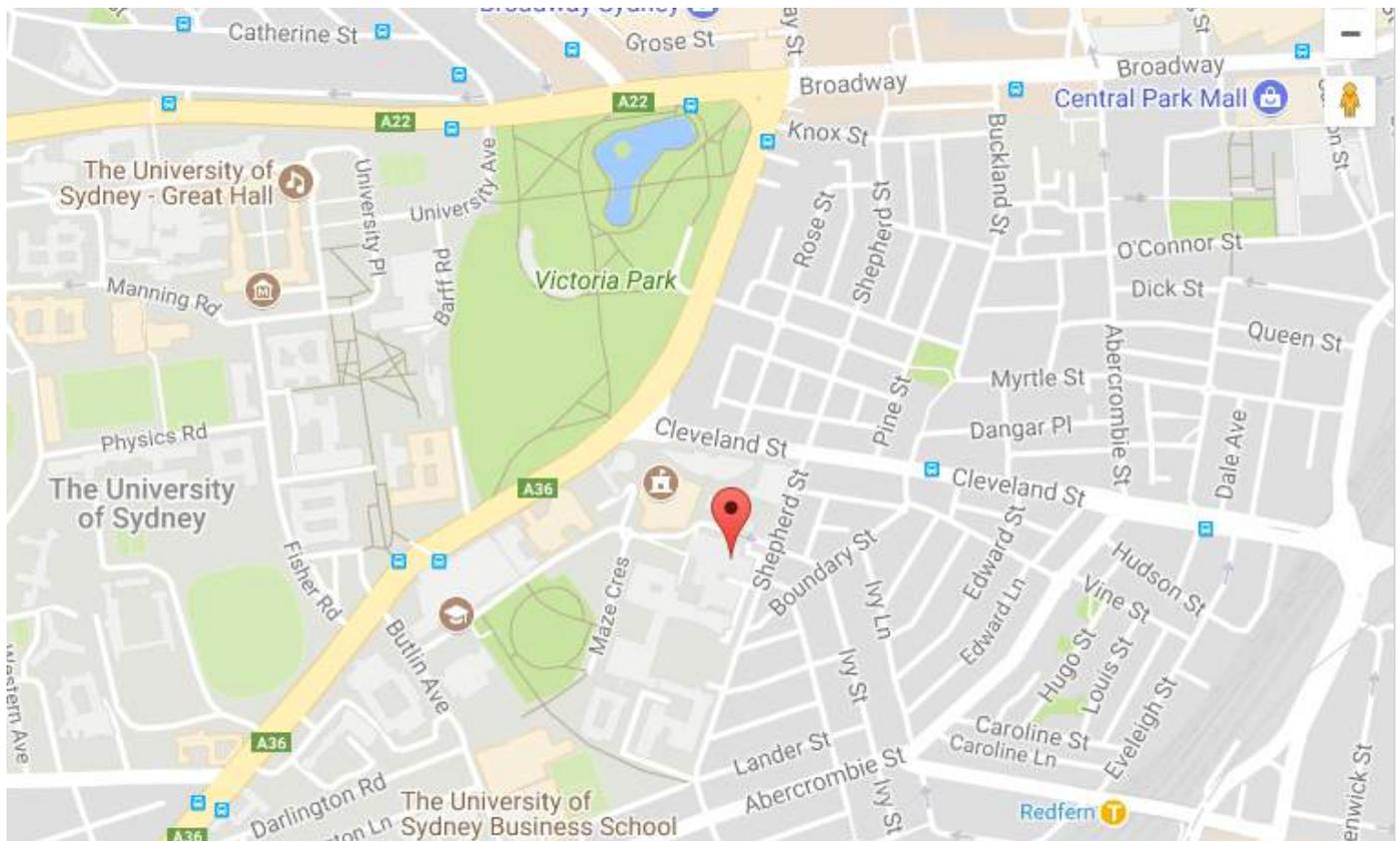
[Aerospace Maritime and Defence Foundation of Australia Limited](#) is a not-for-profit corporation limited by guarantee and established to promote the development of aviation and Australian industrial, manufacturing and information/communications technology resources in the fields of aviation, aerospace, maritime and defence.

**RSVP:** Registration for the evening **is required** by clicking on/copying and pasting into your URL this link: <https://www.engineersaustralia.org.au/Focus> Your registration will be confirmed by email with an attached ticket. **Please print the ticket and present the ticket at the door.**

**Lecture registration includes:**

- **Attendance at the Event and Q & A session**
- **Networking opportunities at the welcome tea and coffee**
- **Following the presentation, light supper (pizzas) will be provided to give the speaker and attendees the opportunity to mingle and to continue discussions.**

**Parking:** is available in the Shepherd Street multi-story car park, located on the corner of Cleveland St and Shepherd St. The rate is \$2 per hour (up to \$6 maximum) but note that only gold coins are accepted in some machines. Parking is also available in University of Sydney On-Campus Parking for \$2 per hour (up to \$6 maximum). Additionally, free parking is available in surrounding streets. Please observe parking restrictions and allow time to drive to the University of Sydney, park, and walk to the venue. **Venue map copy and paste address into your browser:** <http://sydney.edu.au/maps/campuses/?area=CAMDAR> Scroll down the 'Building Bar' on the left hand side to: Mechanical Engineering Building J07 and click



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**Public Transport:** The closest train station is Redfern station, which is a 10 minute walk away from the venue. From Railway Square near central station most 42X bus (e.g. 422, 426...) and the M30 will take you to the University of Sydney (on City Road) – but check with the bus driver before boarding. Please allow time to travel by public transport, including waiting time, and time to walk to the venue. Please refer for further details: <http://www.sydneybuses.info/routes/timetables-route-maps>

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**Sydney Branch's first 'Cool Aeronautics':** In November 2019, the Sydney Branch hosted its first 'Cool Aeronautics' outreach event. It was held in partnership with Canberra Branch and specifically targeted 25 student girls aged between 10 and 12 years. The purpose of the day was to introduce the girls to the fascinating world (and people) of flying, aerospace engineering and space. The schedule included: understanding air traffic volumes and patterns via the FlightRadar app; building scale models of a gas turbine and learning its operation; touring a Qantas Airbus A380 (the first to be refurbished - VH-OQK); and finally, discussing all-things rockets, facilitated by the award-winning USYD Rocketry Society.

The event was a huge success! Positive feedback came from all involved. The girls were 'truly inspired' and both teachers expressed gratitude for the organising time and effort taken by the society. The RAeS Sydney Branch now looks forward to 2020, with more outreach events to come.



*Email thanks from the two schoolteachers: 'Congratulations, we had a sensational day, everything ran like clockwork. It was abundantly clear the amount of time you spent preparing the day and it is very much appreciated. Our girls returned to school energized, engaged and so excited. Between them they had many highlights. At our assembly we were invited to come up and share our day-all impromptu we had 5 minutes to fill, so it was unprepared. We gave a description of the four parts of our day and then handed the mic to the girls asking each of them to share something different. One girl completely describes building the jet engine, another*

*shared the details of the rocketry competition that Sydney University won, another described the rocket challenge, of course the A380 tour featured as a highlight .... again it was clear the impression the day had on each of them. We can't express enough our gratitude.'*

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**Singapore approved to acquire F-35B:** As a lead into the Singapore Airshow 2020, 11-16 February, 2020 – Fly Above Expectations - Singapore's acquisition of the Lockheed-Martin F-35 Lightning II has taken another step forward, with the US Defence Security Cooperation Agency announcing the State Department's approval for the city-state island nation's request to acquire 12 F-35B short take off vertical landing (STOVL) variant of the aircraft.



The initial approval is for four aircraft with a further eight options, and the cost of the deal is estimated to total US\$2.75bn (A\$4bn) including 13 engines, electronic warfare systems and other support systems such as an initial training services, technical publications and a spares package, and access to the data reprogramming lab.

The Republic of Singapore Air Force (RSAF) has long expressed an interest in acquiring the F-35 to replace its fleet of 60 Lockheed-Martin F-16C/D fighters which it expects to phase out from 2030. It has long been reported that Singapore was most keen on the STOVL F-35B, although it had also requested information on all three F-35 variants. Given the size of Singapore's F-16 fleet, it is also almost certain that more F-35s will be acquired in the future, with the 12 approved likely to be just an initial batch.

The STOVL variant of the F-35 will enhance the RSAF's ability to generate air power in times of conflict if access to conventional airbase facilities are denied. Singapore is a little over 700 square kilometres in size, with its main island less than 50 km at its widest point, and it is planned one of its three main airbases will be closed in the early 2020s to free up land for commercial purposes. There have been suggestions that the F-35Bs could potentially operate on Singapore's upcoming Joint Multi Mission Ships (JMMS), a new amphibious vessel design with enhanced aviation

facilities that is due to enter service in the 2030s, although this is unlikely with the JMMS mission likely to be focused on helicopter operations.



The de Havilland DHC-2 Beaver prototype electric aircraft during a test flight at Vancouver International Airport in December. **Bloombera**

### Is a 63 year old seaplane powered by battery the future of flying?:

A Canadian air operator has swapped a vintage de Havilland Beaver's gas-guzzling, exhaust-emitting engine for a modern electric one. When Harbour Air's de Havilland Beaver seaplane first lumbered into the skies in 1956, Elvis' *Heartbreak Hotel* topped the charts, President Dwight Eisenhower was in the White House, and flying icons such as the Boeing 747 hadn't yet been invented. Sixty-three years of bush flying, commuter travel and made-for-Instagram sightseeing later, the aircraft has received a trailblazing retrofit. Earlier this month Harbour Air,

a seaplane operator based in Vancouver, Canada, swapped the six-seater's gas-guzzling, exhaust-emitting engine for a modern, battery-powered electric one. The move gives the vintage plane a new and sustainable lease on life.

Greg McDougall, Harbour Air's founder and chief executive, is the driving force behind the project, one that would make the Wright brothers proud – and possibly Elon Musk, too. "I was an early adopter of the Tesla car and so impressed by their innovation," McDougall says. "When I got the car five years ago, I wondered if we could transfer similar electric engine technology to our planes. Someone was going to do it someday, so it may as well be us."

The regional airline with 40 seaplanes operates half-hour flights carrying up to 19 passengers between Vancouver, Seattle and communities in coastal British Columbia. The short flights make it well suited for a battery-powered engine, says Roei Ganzarski, the chief executive of magniX, the electric-propulsion designer and manufacturer that developed the engine.

**The aircraft will be able to fly for 30 minutes with a 30-minute reserve on a one-hour charge.**

They will plug in and charge at the Vancouver Harbour Flight Centre dock, and pull from BC Hydro, the provincial energy utility's hydroelectric power grid, itself a renewable source of energy.

McDougall flew the 10-minute test flight himself last month, a first step required by regulators. Regulatory review in the United States and Canada will take two to three years, at which point Harbour Air can install the engines and begin accepting paying passengers on all-electric aircraft.

"On the environmental plus side, there is zero carbon burn. In the long run, the operating economics will allow us to make more flights more affordable for a larger audience," McDougall says.

"Consider travel between Seattle and Pullman, Washington, the home of Washington State University," Ganzarski says. "It's a five-hour drive to see my daughter, but an expensive \$US450 [\$650] commercial flight. An electric plane is so much cheaper to operate and the result is lower fares – maybe \$US100 return."

"If you can find an aerodynamically efficient aircraft like the Beaver seaplane that Harbour Air flies, or, say, a lightweight composite aircraft, there is a business case for this mission profile," says Dr Pat Anderson, an aerospace engineering professor at Embry-Riddle Aeronautical University and an expert on electric propulsion.

Local officials in British Columbia are paying attention. Erin Hemmens, a city councillor from Nanaimo, a city of 90,000 on Vancouver Island, flies the 20-minute Harbour Air flight to Vancouver



Qantas ran this de Havilland passenger seaplane in 1958. **Fairfax Archives**

for conferences. It beats a three-hour transit by ferry, she says. "Our city wants to advance climate-friendly policies in an expeditious way, so we celebrated their achievement," Hemmens says.

**Will larger commercial aircraft convert to electric? Not any time soon,** Anderson says. "The Beaver does not need a lot of energy because it flies slow. To go fast, you need a whole lot of energy. The solutions are a lot further down the line and a tough problem for the current state of the art."

Nevertheless, Anderson says the first flight and collaboration between Harbour Air and magniX should be applauded. "The most exciting thing about this flight for me personally is that it signals

a change in how we look at aviation, and how my kids will travel in the future," Ganzarski says.

<https://www.afr.com/life-and-luxury/travel/is-a-63-year-old-seaplane-powered-by-battery-the-future-of-flying>



The aircraft in full battery-powered flight on the test run over Vancouver. **The New York Times**

**MQ-4C Triton arrives in Guam:** The [MQ-4C Triton](#) UAS has arrived in Guam for its initial deployment in the US Navy's Pacific theatre. Unmanned Patrol Squadron 19, the first Triton UAS squadron, will operate and maintain two aircraft as part of an early operational capability to further



develop the concept of operations and fleet learning associated with operating a high-altitude, long-endurance system in the maritime domain. The Tritons will be based out of Andersen Air Force base and operated by Commander, Task Force 72, lead for patrol, reconnaissance and surveillance forces in the 7th Fleet. The MQ-4C Triton will conduct ISR missions that will complement the [P-8A Poseidon](#) and will bring increased

persistence, capability and capacity through its multi-sensor mission payload. Initial operational capability will include four air vehicles with capacity to support 24/7 operations.

**100 years - the Spirit of Australia:** "The story of Qantas is the story of modern Australia – past, present and future. It's a remarkable and unlikely tale of how a humble air mail operation in outback Queensland became a national carrier flying over 50 million passengers a year.

It's a story of service – through peace, war, natural disaster and national celebration. It's a story of innovation – from a 31-stop, 12 day flight to London,

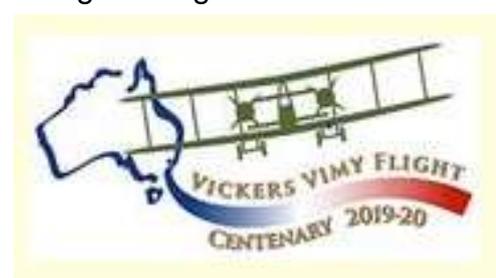


to operating the world's first non-stop flights between Australia and Europe. But most of all, it's a story shared by all Australians. Thanks for joining us in Qantas' Centenary year as we celebrate that story and look towards creating new stories for future generations to tell." Alan Joyce, Chief Executive Officer and Managing Director, Qantas Airways Limited. Refer for further details:

[qantas.com/au/en/100-years-of-the-spirit-of-australia](https://qantas.com/au/en/100-years-of-the-spirit-of-australia)

**Transcontinental Celebration Flight Darwin to Adelaide, 8-22 March 2020:** A mass flight by light, ultralight and historic aircraft from Darwin to Adelaide is planned to leave Darwin March 8 2020 and arrive Adelaide for the weekend of 21-22 March for aviation activities prior to the centenary of the arrival of the Smith aircraft\* on Monday 23 March 2020. The organisers also hope that many aircraft will join in for part of the route.

The gathering of aircraft at Adelaide on the weekend of 21-22 March could be quite large.



Organisers hope for a high proportion of Australian aircraft, and aircraft of historical importance. This is a typical Australian event, relying on voluntary activities of air museums, local authorities, aero clubs and historical associations along the route and elsewhere.

The Aviation Historical Society of Australia (NSW) formed a small committee that has assisted communications throughout the project. This is a big job for AHSA and they

really appreciate all the amazing help we are getting from enroute stops. The proposed itinerary

for the flight involves leaving Darwin on 8 March, with overnight stops at Daly Waters, Cloncurry, Longreach, Charleville, Caboolture, Narromine, Albion Park, Cootamundra, Melbourne and Adelaide with many intermediate stops, including the three big cattle stations on the Barkly Tablelands that the Smith flight passed through during the period 13 to 20 March. To keep up to date register for email updates by contacting Tom Lockley email: [ahsanswsmithflight@gmail.com](mailto:ahsanswsmithflight@gmail.com) or Ph: 0403 615 134 and also check the website <http://ahsansw.com/>



PHOTO: Michael Smith waves from his plane Southern Sun II after completing a re-enactment of Ross and Keith Smith's flight to Darwin from the UK. (ABC News: Rick Hind)

Smith's journey has been filled with extraordinary adventures, breathtaking sights and of course delays and set-backs. Smith flew his Southern Sun SeaBear aircraft from London, across Europe, Africa, The Middle East and throughout Asia, before reaching Australia. During his flight, Smith recreated photographs from the original race which were published in a 1921 edition of a National Geographic Magazine.

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**Kenneth Francis Nicholas Weekes, Esquire, JP, MA(Sydney), Dip Ed, MACE, AMRAeS, OMIE Aust (Ret) 1930 - 9<sup>th</sup> December 2019:**

Kenneth was born in 1930 in Jervis Bay where his father held a position in the Navy. The family bought a house in Campsie, Sydney, where Kenneth attended the local primary school and the Canterbury Boys' High. At 15 years of age, after he won an award as the top junior Air League bugler in Australia, he performed at Sydney's annual Anzac Day Ceremony.

After he left school Kenneth studied to become an aeronautical engineer, through an apprenticeship at Sydney Technical College. He worked at the QANTAS Base at Mascot and then was later transferred to Rose Bay Flying Boat Base. With this qualification he went to London in 1952 where Rolls Royce placed him in charge of maintenance management although he was still only in his twenties. After two years he moved to Canada where he held a similar role with Rolls Royce in Toronto for two years. Then came lengthy industrial action in Canada which, although Kenneth was not directly involved, led to a suspension of his employment as there was little maintenance to be done. Kenneth then found employment in the Australian consulate in New York. Kenneth was eventually obliged to return to Sydney when his mother's health was declining. Unfortunately for Kenneth, Rolls Royce maintenance closed in Australia. Rolls Royce offered him a similar senior position in Germany which he could not accept because of his mother's health. QANTAS was prepared to employ him in Sydney, but was going to have him start on a junior level, a situation he would not accept after the senior positions he had held in England and Canada, and so he joined the New South Wales Public Service, working first in the Land Titles Office followed by the Registrar-General's Office.

Kenneth gained a Bachelor of Arts degree in 1966 and then in 1984 a Master of Arts with Merit from Sydney University. This was followed by a career in teaching senior Modern History in secondary schools.

Until his health began to suffer, Kenneth and I used to attend the Royal Aeronautical Society meetings regularly. When we were no longer able to go to the meetings, Kenneth and I continued to belong to the Society and used to read the Aeronautical Society's publications avidly, often

\*Internationally-renowned adventurer and an Australian, Michael Smith, took off from London on 19 November and followed the route of Ross and Keith Smith, who won the Great Air Race from the United Kingdom to Darwin in 1919. The Great Air Race challenge from England to Australia was announced by the Prime Minister Billy Hughes, just after World War I ended, offering a reward of 10,000 pounds. Almost exactly 100 years since the Smith brothers completed their journey in a Vickers Vimy twin-engined bomber, Michael Smith has re-enacted their flight in his twin-engined seaplane the Southern Sun II. He touched down on Tuesday in Darwin at 3.40pm ACST, a century after his heroes and 20 days after departing the UK.

Much like the original Great Air Race,

discussing different articles in the publications. These magazines were at times passed on to younger people interested in aviation and space travel.

As a young boy he was deeply affected by the suffering he heard from his father who had fought in both World War I (by overstating his age) and who also fought in World War II in the Navy. Kenneth developed a strong social conscience which he expressed mainly through the United Nations Association.

In retirement, Kenneth continued his interest in the Aeronautical Society, along with his interest in the United Nations Association. In 1983 Kenneth and I were jointly given a United Nations Peace Messenger Award by the United Nations Secretary-General, Javier Perez de Cuellar. Because of his family history and his other work, the Queen through the Royal College of Arms bestowed on Kenneth the minor noble title of Esquire – which was celebrated by a function at Parliament House in 1994. In 2019 we celebrated our 50<sup>th</sup> wedding anniversary.

As one of the Forty-Niners and as a very interested member of the Royal Aeronautical Society, Kenneth kept up with his contacts in the aeronautical world right to the end. Valerie Weekes

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## **2019 Annual General Meeting**

### **Royal Aeronautical Society Australian Division Sydney Branch Inc**

Date: **Wednesday 27<sup>th</sup> May 2020** Time: **Commencing 18:00 hours - sharp**  
Venue: **Mechanical Engineering Theatre, Mechanical Engineering Bldg, Uni of Sydney**

Venue map (copy and paste address into your browser): <http://sydney.edu.au/maps/campuses/?area=CAMDAR>  
**Scroll down the 'Building Bar' on the left hand side to: Mechanical Engineering Building J07 and click.**

Refreshments will be available prior to the commencement of the meeting.

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### **2019 AGM Agenda**

**PRESENT:** Members to sign attendance book.

**APOLOGIES:**

**PREVIOUS MINUTES:** Minutes of the 2018 AGM, discussion and motion to accept.

**BUSINESS ARISING:** Discussion and motion to accept.

**CHAIRMAN'S REPORT:** Presentation of the 2019 Annual Report, discussion and motion to accept.

**TREASURER'S REPORT:** Presentation of 2019 Financial Statement. (Audited report will be sent with the June, 2020 Newsletter) discussion and motion to accept.

**ANNUAL ELECTIONS:** The Hon Secretary to report on Nominations received for the classes of Committee by the due date Tuesday 5<sup>th</sup> May 2020 and, should there have been more Nominations received than positions available for any of the classes, the result of elections.

**APPOINTMENT OF HONORARY AUDITOR:** Mr Stephen Howard, Harrison and Howard.

**GENERAL BUSINESS:** Any business raised and accepted by the Chairman.

**CLOSE OF AGM:** Thank you for attending the AGM and the Committee looks forward to your continued support.

**2020 Committee Nomination Form:** Should you wish to nominate for the 2020 Committee, please complete the Nomination Form below and follow the instructions.

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**2020 Committee Nomination Form:** Send to: The Honorary Secretary, RAeS Aust Division Sydney Branch Inc, 88 Trafalgar Street, Annandale, NSW 2038 or Email: [sydneybranch@raes.org.au](mailto:sydneybranch@raes.org.au) (please ensure that Nomination Forms have been correctly signed)

The 2019<sup>th</sup> Sydney Branch Annual General Meeting is to be held on Wednesday 27<sup>th</sup> May 2020, at 18:00 hours, in the **Mechanical Engineering Theatre, Mechanical Engineering Building, University of Sydney**. In accordance with the Branch Rules of the Sydney Branch of the Royal Aeronautical Society Inc passed at the AGM held 7 March, 2018, nominations for the Committee are called and shall be made in writing and signed by one member of the Branch and countersigned by the Nominee. The Committee consists of one Chairman, and 3 Student Representatives, who hold their positions for 12 months, and 10 Ordinary Committee Members (in total 14 people). The 10 Ordinary Committee Members will have a term of 2 years. As stated in the Sydney Branch Rules approved 7 March, 2018, half of the 10 successful candidates elected at the 2018 AGM will

hold office for one year whilst the remaining five will hold office for 2 years. The 2019 Committee determined that the five Ordinary Committee Members who will hold their positions for a 1 year term will be: David Adkins MRAeS, Timothy King, Jeffrey Lock Affiliate, Peter Marosszeky FRAeS, and a vacant position (not filled at the 2018 AGM). Nominations are therefore called for the aforementioned 5 Ordinary Committee Members, Chairman, and 3 Student Representatives.

**Please forward completed Nomination Forms to the Branch Honorary Secretary at the address above by Tuesday 5<sup>th</sup> May 2020 which is at least twenty one (21) days prior to the 2019 Annual General Meeting.**

I .....(Nominator's Full Name)

of .....(Nominator's Address)

nominate .....(Nominee's Full name)

of .....(Nominee's Address)

as an: Ordinary Committee Member / Student Representative / Chairman (*delete 2 of these classes as appropriate*) for the Sydney Branch of the Royal Aeronautical Society Australian Division for the Year 2020.

Signed:.....Date:.....Member Number:.....(Nominator)

Signed: .....Date: .....Member Number:.....(Nominee)

Tel contact: .....(Nominee) email: .....(Nominee)

**NOTE: PLEASE USE ONE FORM FOR EACH NOMINATION**

**Office Use Only:** Nomination received by the Sydney Branch Hon Sec:.....(Initials).....(Date)

**Closed Member Only Group on Facebook:** Sydney branch is live video streaming our monthly branch lectures. Watch lectures live or at a later time, at the "RAeS - Sydney Branch - Members Only" group within Facebook. Please note that this service is only available to financial members of the Royal Aeronautical Society.

**Past Newsletters are now stored on our website:** Members are advised that all Sydney Branch Newsletters since February 2012 are now stored on our website. To access this information enter our web address ( [www.raes.org.au](http://www.raes.org.au) ) into your browser, click 'About' then 'Sydney Branch' and scroll this page to the heading 'Sydney Branch Newsletters'. Newsletters are arranged by month within each year heading.

**Society Merchandise for Sale:** Sydney Branch has a selection of Society Merchandise for sale at its regular monthly meetings. Items include Society Ties, Tee Shirts, Caps, Pins, Lapel Badges, Silver Kestrel Brooches, and Mugs.



Our Sales Director, Mr David Adkins, accepts cash, cheques, and credit cards through PayPal.

**Aerospace Websites:** [www.57rescuecanada.com](http://www.57rescuecanada.com) : Follow Capt. Karl Kjarsgaard's adventures to recover Halifax bomber LW170 which is resting beneath 5000ft of water off the Irish coast; [www.adastron.com/707/updates/updates.htm](http://www.adastron.com/707/updates/updates.htm) : Diary of Boeing 707-138B XBA formally Qantas EBA.

[www.airshow.com.au](http://www.airshow.com.au)

[www.atsb.gov.au](http://www.atsb.gov.au)

[www.aviationmuseum.com.au](http://www.aviationmuseum.com.au)-Temora Aviation Museum;

<http://boxkite2014.org/book/book.htm> - The Boxkite project.

[https://en.wikipedia.org/wiki/Rolls-Royce\\_Trent](https://en.wikipedia.org/wiki/Rolls-Royce_Trent);

[hars.org.au](http://hars.org.au) Historical Aircraft Restoration Society

<https://herox.com/SpacePoop> The Space Poop Challenge

[www.powerhousemuseum.com/whatson](http://www.powerhousemuseum.com/whatson)

<https://qfom.com.au/> Qantas Founders Museum, Longreach, Qld

<http://www.singaporeairshow.com/>

<https://www.youtube.com/watch?v=JGjmRRTThdk> How TIME created their new cover image with 958 drones

[http://www.rbogash.com/B-52/B-52\\_Disassembly.html](http://www.rbogash.com/B-52/B-52_Disassembly.html) How to move a B-52 without flying it – The Final Disassembly and Transport Update for the move scheduled 3/6/2018 - with the wings split and the fuselage in final stages of prep before hitting the freeway.

<https://airandspace.si.edu/collection-objects/assembly-bio-harness-armstrong-apollo-11>

**Diary: 11-16 February, 2020: Singapore Airshow – Fly Above Expectations** - Changi

Exhibition Centre Singapore. Every two years, high-level government and military delegations, as well as senior corporate executives around the world attend the Singapore Airshow to forge partnerships and seal deals in this region. As Asia's largest Airshow, this is the place to be for leading aerospace companies and budding players eager to make their mark in the international aerospace and defence market!



The event offers a unique platform for industry thought leadership through its high-level conference, forums and co-located events. Leading industry players, government and military chiefs gather here biannually to contribute to dialogues, exchange ideas and seek solutions and strategies to advance the interests of the global aerospace and defence sector. For further details refer: <https://singaporeairshow.com/trade/about-singapore-airshow>

**2-3 May 2020: Wings over Illawarra – The Sydney Airshow** - Immerse

yourself in history as you wander through rare displays of vintage and classic aircraft including the fully-restored Super Constellation and record breaking Qantas 747 along with some beautifully restored WW2 fighters. In 2020 your entry ticket will once again include access to the Historical Aircraft Restoration Society aircraft that are open for inspection. *To thank the supporters of the*



*Wings Over Illawarra event this year, Wol* are offering tickets for the 2020 event at half price - but be quick, they're only available for a limited time. For further information please refer:

<https://www.wingsoverillawarra.com.au/>

**4-7 May: AUVSI Xponential 2020 – Find Your Edge – being held at the Boston Convention and Exhibition Center, Boston.** Xponential 2020 is the global

stage for everything unmanned - from state-of-the-art propulsion technology, sensors, energy storage and UAS mitigation solutions to what's coming over the horizon in AI, 5G, edge computing and more.



As the largest, most significant event for the unmanned systems industry, you'll find your edge as you explore the latest technology innovations, develop new perspectives as you hear from industry luminaries, and cultivate creativity at special networking events where you will meet some of the most influential leaders in the unmanned and autonomous space. Further details:

[www.xponential.org/xponential2020](http://www.xponential.org/xponential2020)

**15-23 August 2020:** 43rd Scientific Assembly of the Committee on Space Research (COSPAR) and Associated Events - COSPAR 2020 will be held in Sydney. Host Organization: Australian Academy of Science; Scientific Program Chair: Prof. Iver Cairns, University of Sydney, School of Physics. Abstract Deadline: **mid-February 2020**, The theme of the COSPAR 2020 Assembly is *Connecting Space Research for Global Impact*. More information can be found at [www.cospar2020.org](http://www.cospar2020.org)



**Wednesday, 30 September 2020:** 62<sup>nd</sup> Sir Charles Kingsford Smith Lecture to be delivered by Mr Alan Joyce AC FRAeS, Chief Executive Officer and Managing Director, Qantas Airways

Limited. Venue: The Refectory, Holme Building, Science Road, The University of Sydney – commencing 18:00 hours. Further details to be advised. Please **'Save the Date'**.

**23-28 February 2021: The Australian International Airshow** will comprise industry-only trade exposition days from Tuesday 23 February to Friday 26 February, with public airshow and entertainment days from Friday 26 February to Sunday 28 February. AIRSHOW 2021 CEO Ian Honnery said the RAAF Centenary milestone, together with



the 2020 Centenary of the formation of Qantas, means organisers are planning for an event that will eclipse Airshow records. For further details refer: [www.airshow.com.au](http://www.airshow.com.au)

**March 31, 2021:** Marks the Royal Australian Air Force 100 years as an independent service. For further details refer: [airforce.gov.au/our-mission/air-force-2021](http://airforce.gov.au/our-mission/air-force-2021)

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