



AIR PILOT



INSIDE

**TROPHIES AND AWARDS - LIVE
THE GREEN AVIATION EVENT
UNDERWATER 'FLYING'**



THE HONOURABLE COMPANY OF AIR PILOTS incorporating Air Navigators

FORMER PATRON:

His Royal Highness
The Prince Philip
Duke of Edinburgh KG KT

GRAND MASTER:

His Royal Highness
The Prince Andrew
Duke of York KG GCVO

MASTER:

Sqn Ldr Nick Goodwyn MA Dip Psych CFS RAF (ret)

CLERK:

Paul J Tacon BA FCIS

Incorporated by Royal Charter.
A Livery Company of the City of London.

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Except where specifically stated, none of the material in this issue is
to be taken as expressing the opinion of the Court of the Company.

DIARY



With the gradual relaxing of lockdown restrictions the Company is hopeful that the following events will be able to take place 'in person' as opposed to 'virtually'. These are obviously subject to any subsequent change in regulations and members are advised to check before making travel plans.

DECEMBER 2021

8 th	AST/APT	APH
16 th	GP&F	APH
16 th	Carol Service	St Michael's Cornhill
16 th	Carol Service Supper	George & Vulture

JANUARY 2022

7 th	New Year City Service	St Michael's Cornhill
20 th	GP&F	APH
20 th	Court	Cutlers' Hall
25 th	APBF AGM	RAF Club
27 th	ITF	by Zoom

FEBRUARY 2022

1 st	Luncheon Club	RAF Club
10 th	GP&F	APH

Cover photo: At the annual Trophies & Awards Banquet at the Guildhall on 21st October, The Master presents a Centenary Sword to the RAAF; PM Ian Perry 'flying' a submarine (Crown Copyright)

Applications for Visits and Events

Please kindly note that we are ceasing publication printed 'flyers' and application forms for visits and events. From now, details and applications for all visits and events will only be available online - on the website and a via links in the e-news and events bulletins which are circulated by email to members.



Access the Company's
website via this QR code,
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A MESSAGE FROM YOUR EDITOR...



In the words of the Aviation Minister Robert Courts (pp27-31): "Flying is not the problem; emissions is." Before, during and after November's COP 26 event, questions have been pointed at Ministers and others, asking how they can reconcile the encouragement of

aviation or allowing the development of the third runway at Heathrow with their goal of Net Zero by 2050. At the same time the Minister of Transport has been attacked for opposing the redevelopment of airfields as housing or industrial estates, and for seeking to preserve the availability of 100LL aviation fuel.

The implication – seemingly adopted uncritically by those asking the questions – is that all aviation is bad for the environment, a noisy and polluting neighbour. Those same questioners and media "experts" seem to have accepted – again uncritically – that battery-electric propulsion is good for the environment and must replace combustion engines at the earliest opportunity. This is despite the environmentally damaging extraction of rare earths and metals needed for battery manufacture, and the so-far-unresourced demand for electricity that a wholesale switch would bring. (In October and November, the UK was seeing renewed use of gas and even coal for electricity generation because unseasonably calm weather had reduced the output of the windfarms on which it increasingly relies.)

What seems to be being lost is the ability to think in terms of other than black-and-white on such critical matters. Aviation is only "bad" if it fails to adapt to the challenges of climate change – and the clear message from the Company's Green Aviation event reported on in this issue is that it is adapting, and has the support of the financial community to further that change. Battery power is a part – but only a part – of the solution for decarbonising transport both on the ground and in the air, and there is every chance that the developing technology of hydrogen will supplant much of what is currently seen as battery-electric's inevitable dominance within 10 years. Avgas (100LL) will be replaced by some form of sustainable, less-toxic, fuel given time and encouragement, just as sustainable aviation fuels (SAF) are starting to replace kerosene on larger aircraft.

Aviation, from local GA to heavy long-haul, is transforming itself at least as rapidly as are other sectors, and those who oppose its continuation and development on the back of the noise and pollution it generated 50 years ago are denying reality. The question facing the whole aviation community must be: who is going to stand up in public and correct the popular assumptions and prejudices which are so dangerous to our future?

Allan Winn - Editor

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Guidelines for submissions to Air Pilot

Please submit contributions as follows:

- Text in word document, including your name below the title of the piece;
- No embedded photos;
- All images to be sent as jpeg files with a file size of at least 2MB;
- More than 2 images to be sent via a Dropbox file, rather than an e-mail attachment



NEWS ROUNDUP



THE ZEPPELIN WALK

By Assistant Elizabeth Walkinshaw

On 8th/9th September 1915, Kapitanleutnant Heinrich Mathy undertook a bombing raid on London in his P Class Zeppelin L13.

Our Air Pilots' Walk on 11th October followed part of the route taken by L13, starting in Queen Square and ending at Guildhall, with a break for a hearty lunch in the Butcher's Hook & Cleaver pub at Smithfield. This walk encompassed so much history as we passed through the streets following its path and viewing the plaques which remembered the bombings that this write-up cannot give all in detail, so I will cherry pick some of what we encountered and would strongly encourage you to take up a place on the next walk to learn more.

Our first stop was at Queen Square where the first explosive bomb landed, just missing the surrounding hospital buildings, marked by a plaque inset in the paving. Here, there is also a memorial bench dedicated to the 16 medical staff killed in the crash of [Staines Trident] G-ARPI in 1972. Carrying on, we peered through the glass doors of the Dolphin public house where the clock that survived the bombing hangs on the wall in the rebuilt pub, showing the hands stopped at 22:49 when the bomb dropped (the hands having now slipped to 22:40).



The magnificent interior of St Bartholomew The Great

saffron to stop rats nibbling the pupils' ankles!

In front of Barts hospital, which is the oldest English hospital to still stand on its original site, is Smithfield

(Smooth Field), a place of public execution where there are memorials to William Wallace, Wat Tyler and protestant martyrs.

The visit to St John Museum, Priory

Church of St John and the garden there stood out as one of the highlights of the day. The museum tells the story of the Order of St John from its origins to its modern-day role with St John Ambulance. The Priory Church and the Crypt below are fascinating and the garden is truly lovely.

Retracing our steps past 41/42 Cloth Fair, the only houses to survive the Great Fire of London in 1666, we visited the Church of St Bartholomew the Great, having time to view the amazing architecture. It was then on to Little Britain and Bartholomew Close where a 600lb (270kg) bomb named the 'Love Gift' by Mathy was dropped, creating an eight feet (2.44m) deep hole.

From there, we made a poignant stop in Postman's Park to view the postings on the wall, recognising worthy deeds by ordinary people and particularly those who died while saving the lives of others and who, otherwise, might have been forgotten.



The walkers (Author on right)

Finally, to Gresham Street, where the Hall of the Goldsmiths' Company and Wax Chandlers' Hall can be found, our tour culminating with a visit into St Lawrence Jewry, the Church of the Corporation of London where we rounded off our fantastic tour.

A huge thank you to Vic Flintham and Chris Ford for this great event.



Wren House's blue-coated figures

VISIT TO WW2 RAF OPERATIONS BUNKER AT UXBRIDGE

By Liveryman Chris Green



Everyone will have seen pictures in the films, or elsewhere, of WAAFs standing around the plotting table controlling the fighter squadrons during the Battle of Britain. For me and, I guess, many of us visiting "The Hole", as it was known to those who worked there, for the first

time it was quite a revelation that it was so deep below the ground and so very well disguised as part of what was RAF Uxbridge.

On arrival we were able to wander around the exhibition hall at ground level before descending the 74 steps into the Bunker and the Operations Room, which is 60ft below the surface. To hear that this was excavated in 1938, following the threat from the Munich crisis, and was completed in August 1939 in total secret, was quite astonishing.

Jack, the volunteer guide, gave us a detailed briefing as to how the Bunker operated with 70-100 people crammed in for 8-10 hour shifts. They were constantly updating details of the readiness of 11 Group squadrons and developing enemy attacks using the Chain Home radar system and the Royal Observer Corps, who were vital to continue spotting enemy aircraft as they flew inland as the radar with its fixed aerials was only able to look out to sea.



The well-concealed entrance

To see how the world's first integrated air defence system worked so well with just the manual positioning of wooden blocks

on the map table and light bulbs being switched on-and-off on the display wall, all working to the Dowding System shows how things have advanced but are not necessarily achieving much more in these days of computers.

The system was rolled out as the prototype to the other five group headquarters and again it was interesting to hear that the system also integrated fire and rescue, air sea rescue, ship convoy protection and was vitally important in the planning and protection of the beaches and ship convoys during the D-Day landings.

We all then gathered in the new lecture theatre to listen to a presentation by Dr Rachael Abbiss, the Military History Curator of the Bunker, who added detail and personalities to the Bunker's story. That included how Sir

Trafford Leigh-Mallory became Air Officer Commanding 11 Group by having friends in high places and his not very good relations with Air Vice Marshal Keith Park who had been Air Officer Commanding from April to December 1940.



The situation board

She then told us about the preparation for the D-Day landings involving the Bunker and the Combined Control Centre, Hillingdon House, an 18th century mansion which had been used in the Great War as a convalescent hospital for the Canadians. During World War Two the mansion was linked by GPO cables running down the stairs into the bunker. From there 150 squadrons were co-ordinated on a 24h basis.

The Master thanked Dr Abbiss for her detailed and enlightening talk and presented her with an Air Pilots plaque. Returning to the exhibition hall gave me the opportunity to read many of the stories of the WAAF personal who worked in the Bunker throughout hostilities and a poem by Catherine 'Kitty' Brightwell so well summed up how it must have felt to be so involved in the Battle of Britain from this extraordinary building.

FINAL FAREWELL TO A SPITFIRE PILOT

*Your task on earth is finished, young man.
You have done your duty.
You have learned to live with death
Before you could live your life.
In your beautiful craft you have
Trawled the bounds of space;
You have flown higher than any bird.
Your youthful years have been spent
In the service of your country and others.
For this you have given all;
No future for you.
The hopes and dreams put aside
Fly away, Valiant Heart, on your silver wings,
Up, up and away from this damaged world.
I pray that you have crossed the edge of space
And found the peace which passes all understanding
Safe in the arms of your God.*

PRINCE OF WALES GAINS A SWORD

By Assistant Richie Piper



Capt Higham receives the sword from the Master and PM Robert Pooley (Richie Piper)

A limited number of Court members, led by Master Nick Goodwyn and supported by Past Masters Bob Pooley (provider of a beautiful sword) and Tudor Owen (Liaison Officer for the ship) visited our newest affiliate HMS *Prince of Wales* (HMS PWLS) whilst the ship was docked at Portsmouth. As well as cementing the relationship with HMS PWLS soon after the ship was declared operational in September, it was the first possible occasion to present the sword from the Air Pilots to the ship and it was received with pleasure by Capt Steve Higham, who has commissioned a cabinet to be made to display it and will keep it with him whether in his day cabin on the bridge or rear Captain's cabin.

Following the presentation by the Master, PM Pooley gave an interesting talk on the significance and history of swords. The Court members had the opportunity to view the ship including the Flying Control Room ("Flyco") where Commander Air "Wings" Phil Beacham explained Lockheed Martin F-35B operations.

The ship has impressive stability with the four 120t stabilisers to limit pitch and roll to less than one degree, equating to only 20ft of movement at the stern. Indeed, in landing trials off the US coast earlier in the year, the stabilisers were manually controlled to induce movement to reach all test points!

Deck Officer Lt "Tiny" Richardson recalled Young Air Pilot Becky Kwo from her reserve deployment on HMS PWLS for her interest and enthusiasm, which was not dimmed

when acting as cold and wet casualty in a crash drill!

Walking up the ski ramp and looking at the short 350m take-off run gave a clear indication of the STOVL characteristics the ship exploits. HMS PWLS is having communications upgrades for a NATO exercise next year, where she will be the exercise flag ship.

Strike officer Lt Cdr Neil Tuckwood was an excellent host looking after the group and answering the many questions the party had. It is hoped a fuller visit will be arranged next year for members.

Air Pilots on the flight deck





THE LUNCHEON CLUB RETURNS

By Liveryman John Robinson

After four cancellations "due to Covid" the Luncheon Club reconvened at the RAF Club for its 60th session on Tuesday 21st September. Sixty-four members and guests sat down to a three-course lunch in the most convivial of settings and all were pleased to be back and sociable again. After lunch the Chair was delighted to introduce Lt Col Kent Johnson USAF Ret, to talk on "The US Border Force Air Assets and Operations".

It was a welcome back to the United Kingdom and The Honourable Company for Kent. During his time in the USAF he flew the A-10 on a tour in the UK and also the F-15E. For a tour away from flying he was a ground forward air controller in Gulf War One. Then held a staff officer's position in the Pentagon before returning to the UK to become the senior USAF advisor to the Commandant of the RAF Air Warfare Centre. It was during this posting that he was introduced to GAPAN (now the Honourable Company) by attending a Trophies and Awards Banquet and subsequently joined the Company. Kent went on to become a Liveryman and serve on the Court as an Assistant. On his return to the USA he became Chairman of the North America Region. Kent's talk covered the problems of controlling would-be immigrants from Central and South America attempting to illegally cross the border between the USA and Mexico, a situation not dissimilar to that of the UK with migrants

trying to cross the English Channel. The big difference is that the USA has to patrol a much larger boundary: the estimated distance that has to be controlled is 1,100 miles, no mean job. For this task over 1,200 federal agents are deployed and the airborne element uses aircraft ranging from Cessna C172 through King Air 350ER and Bombardier DHC-8Q200 to Lockheed P3 EW as well as Eurocopter AS350, EC120 and Sikorsky S76 helicopters. Unmanned assets include Predator B and drones. Most of the aircraft are fitted with appropriate survey sensors and where possible are operated single pilot. It is interesting to speculate how the UK Border Force would manage its Channel task with assets such as these!



Kent Johnson (pictured when an Assistant) entertained luncheon guests

After some quite searching questions the Master kindly thanked Kent for the insight into the work done by the Border Patrols and for his willingness to come over from the USA specifically for the Luncheon Club. We wish him a speedy recovery from the illness which kept him from the T&A.

GAZETTE

APPROVED BY THE COURT 18TH NOVEMBER 2021

ADMISSIONS

As Upper Freeman

David Daniel ANDREOLETY (OS)
David BRADSHAW (AUS)
Jonathan Mark BRADY (HK)
Tony de BRETT
Florent COLOMBINI (OS)
Julian Algernon Delamain CROCKER (OS)
Neill Cameron EVANS (OS)
Steve GRZEBINIAK (AUS)
Ross Francis LANGLEY (HK)
Jon Douglas MINNS (AUS)
Mark Alexander PETRIE
Sam William QUINN (HK)
Warwick Deane RAYMONT (AUS)
Cameron Alexander STEWART
Benjamin James WARD

As Freeman

Stephen BEALEY
Sylvian GLOUX
Melissa Meyer MASH

Robert William RODGERS
John Russell SAUNDERS (HK)
Belinda Jane SCOTT (NA)
Peter James WILSON (AUS)

As Associate

Matthew Robert BARTLETT
Sam CHURCHWARD (AUS)
James JARMAN
Harry Edward KARMEI
Jacob NELSON
Eleanor WHITE

Scholarship Winners 2021

Tyler James AUDU-MCGREGOR
Christopher John BARROTT
George Allan COE
Charlie Luke GAZZARD
Max Xavier ELLISON
Joseph Paul HADLEY
David Warren HART
Luke Francis MCCONNELL
Omar MSHIHADANI
Anne Katrin SOLTOW
Gary JACKSON

ACKNOWLEDGED BY THE COURT

REGRADING

As Upper Freeman

Graham BUNN (AUS)
Hendra MAHENDRA (HK)
David SAMPSON (HK)

To Livery

Mark GREEN
Kristiina TERVO
Peter TAYLOR
Simon LEWIS
Jonathan HILL
Martin HATTON
Jonathan MARSDEN

REINSTATEMENT

Upper Freeman

Richard Ian STANLEY
Natasha QUINN (HK)

Freeman

Alan MOSS

DECEASED

Alan COTTLE
Richard HODDER (AUS)
Charles PACHAL (NA)

RESIGNATIONS

Darren BROGDEN
Paul BROWNLESS (OS)
Brett CLAYTON (NZ)
Simon CORNISH (HK)
Henry DE BEER (HK)
Ronald DICKIE
Sorcha DIDIER
Mike EVANS (HK)
Christopher GALL (HK)
Justin HART (HK)
Sahil HATHIRAMANI (HK)
James HAUGEN (HK)
Brian HEINEY (HK)
David HOUGHTON
Greg HUNKA (HK)
David HUGHES (HK)
Dennis HUME (HK)

Adrian IRWIN
Andrew JEPPS (HK)
Darren KEFFORD (HK)
David LONGERAGAN (HK)
Eva MARSEILLE (HK)
Anita NEWCOURT
Matthew NG (HK)
Raymond NG (HK)
Oliver PAYNE
Tiku PATIDAR (HK)
Brett PETERSON (HK)
Denis PORTIER (HK)
Michael RAWDEN
Luke REWEGA (HK)
Scott RICHES (HK)
William STURT
Roger THEAKER
Marcus TOMBLIN (HK)
Luke VERHOEFF (HK)
Charles WHEELDON
Billy WONG (HK)
Christopher WRIGHT (HK)



RENEWAL, RECOGNITION AND REMEMBRANCE

By The Master, Sqn Ldr Nick Goodwyn



At the election of the Lord Mayor

RENEWAL. In late September, I exercised my right as a Liveryman to participate in the Election of the Lord Mayor of the City of London. This is a right that was granted to the Liverymen of the City of London by King John in the Magna Carta of 1215. The Lord Mayor was first appointed by King Richard I in 1189 but the City of London won the right to elect him themselves and it is one of

only three clauses of Magna Carta that are still extant.

With all the other Masters, Prime Wardens and Upper Bailiff of the several Livery Companies we lined up in the correct order of precedence and then processed into Guildhall to take our places at the front of the hall below the Hustings. A second, grander procession then followed us consisting of the Lord Mayor, Aldermen, Sheriffs and Officers to take their seats on the Hustings. The Common Crier and Sergeant-at-Arms then proclaimed silence with a voice that would waken the dead, and then directed "All gentlemen to be covered in the Hall" and "All those who are not Liverymen to depart the Hall on pain of imprisonment." We then came to the main business of the meeting, for the Liverymen to choose two persons from the three Aldermen who have served as Sheriff but not yet been past the Chair. To allow us to do that without undue influence the Lord Mayor then left the Hall with the Aldermen who have passed the chair, the Recorder and the Town Clerk.

Our own court election to warden echoes this ancient process with potential candidates declaring that they will stand for election 'now' or 'later' and so Alderman Vincent Keaveney was duly elected as the 693rd Lord Mayor and he will be installed by his predecessor William Russell at the Silent Ceremony in Guildhall on Friday 12th November; and we Air Pilots will celebrate that event by participating in the Lord Mayor's show the following day. A year in the City and livery is thus renewed.

Renewal was an underlying theme of the Green Aviation



Masters various gather to elect the Lord Mayor

Event of the Air Pilots and Worshipful Company of Scientific Instrument Makers held in Glaziers Hall and attended by the Lord Mayor. My fellow Master, Charles Holroyd, and I welcomed the opportunity to work in partnership with a sister Livery Company to create the event which sought to bring together the heart of UK finance with government, the aviation sector and academia to demonstrate leadership in decarbonising the aviation sector and build investor confidence in the transition to zero emission aircraft technology and energy sources. There was an impressive line-up of keynote speakers including the LM; Sheriff Alison Gowman; Robert Courts MP, Minister for Aviation; Sir Stephen Hillier, Chair of the UK CAA; Marion Geoffroy, MD of Wizzair; and an outstanding group of people to have the afternoon panel discussions, bringing together experts from all these stakeholder groups.

From the earliest days of aviation, pilots have always played key role in the introduction and acceptance of new technology and the same will be true for green aviation with renewable energies, novel airframes, emergent propulsion systems, and operational procedures. Clearly the development of the technologies to achieve the Jet Zero High Ambition pathway will be indomitably linked to the pilots of the future and how those pilots will operate and interact within the operational green environment. With the stakeholders who were present and the Air Pilots as an independent and non-partisan organisation, with a unique position in both aviation and the City, the aim was to start a conversation about how these parties can work together to deliver the government's decarbonisation targets and the Green Aviation event was the start of that conversation.

My sincere thanks go to Liveryman Robert Seaman for his inspiration and dedication in putting together the event and also to Warden John Denyer, our Learned Clerk, Liveryman John Turner and the environment working group and our members for all delivering the outstanding day.

RECOGNITION. We returned to the Guildhall for our Trophies and Awards Banquet, 30 years after David Mauleverer, our Master of the day, used considerable



Lunch with Liveryman Flt Lt Colin Bell

charm and persuasion to enable the then Guild to use the Great Hall for our banquet, the first livery company to do so and as such we have been the envy of many other Livery Companies since.

We were able to celebrate success, bravery and achievement in aviation in the spectacular and hallowed hall again after the hiatus of last year and honour those who were recipients of our trophies and awards both for last year and for this. It was wonderful to welcome so many fellow Air Pilots, Liveryman and guests to dine together again.

It has, perhaps, never been more important to be able to recognise achievement and success in aviation which has been challenged as never before, with widespread concerns about business, careers, employment, and health and we should be very proud of the way Air Pilots have met such recent challenges. As a Company, we have lost good friends, colleagues and distinguished Past Masters but we have found new stars and there has been a great deal of positive change. While we continue to emerge from this pandemic and from its impact and effect on so much of our industry, we were able to take the opportunity to focus on that essential and fundamental element that is the core of aviation - the people, the Pilots, Navigators, Rear Crew and their like whose dedication, application and bravery leave all of us in awe and appreciation, and who exemplify what is great and good in our profession. We should be very proud that the Air Pilots awards have an outstanding reputation worldwide.

At the Banquet, I was able to make one other 'thank you' as this last year had been like no other and my predecessor as Master, Captain John Towell, and his consort Linda gave so much of themselves in supporting and leading our Company in the most challenging of circumstances. With sincere gratitude, I made a presentation of a René Lalique *Fleurons* coupe plate, introduced in 1935, to them on behalf of the Company.

Our principal guest was Air Marshal Gerry Mayhew CBE, Deputy Commander Operations, whom I first met at the RAF selection centre at Biggin Hill; we subsequently arrived at the RAF College Cranwell and graduated together on the Queen's Parade on 28th July 1988. It was clear from the very start that he was destined to have an outstanding career in the RAF and Gerry's talent and natural ability as an outstanding officer and leader and coupled with such a warm and engaging personality was immediately evident as he delivered an excellent speech to bring the Trophies and Awards Banquet to a very satisfying close.

We will have recognised achievement at the Scholarships Presentation Ceremony after the November Court

meeting and I would like to acknowledge and thank all our members who participate in the selection, horse-trading and support to our comprehensive programme of scholarships and bursaries. After many years leading this team, Liveryman Tricia Nelmes is stepping down and I would like to thank her for dedication and her outstanding contribution in inspiring so many budding aviators over those years. Assistant Kat Hodge is taking up the reins from Tricia and I wish both of them continuing success for the future.

REMEMBRANCE. With the time for remembrance upon us, I was honoured to attend a service at the Bomber Command Memorial and lay a wreath on behalf of the Air Pilots. It is such a beautiful and poignant reminder and tribute to the 55,573 Bomber Command aircrew who lost their lives in the second world war. I will also have laid a wreath at Westminster Abbey in memory of the



The moving ceremony at the Bomber Command Memorial

Merchant Air Services. The spirit of those aircrew lives on and is embodied in DH Mosquito pilot and Liveryman FI Lt Colin Bell DFC, who celebrated his 100th birthday earlier this year and with whom I shared dinner at the RAF Club recently. The burden of Bomber Command was very much shouldered by the Avro Lancaster, designed by Roy Chadwick, which first flew 80 years ago and of which some 7,377 were built. The iconic Lancaster is of course a perennial airshow performer of the Battle of Britain Memorial Flight, one of our affiliated units and which has a new Officer Commanding Sqn Ldr Mark 'Suggs' Sugden who has taken over from Sqn Ldr Mark Discombe. We wish both well in their next tours. A number of Air Pilots attended the (delayed) Battle of Britain 80th (plus one) anniversary dinner at the RAF Museum Hendon which included a special flypast by a Spitfire from the BBMF on a glorious evening and then a dinner amongst the aircraft of that era. A very special evening in a very special setting and we are indebted to PM Malcolm White and Vanessa for the close ties and relationship we have with the Museum.

To close, I am looking forward to the Company Carol service at St Michaels Cornhill on Thursday 16th December and to Christmas and a new year. May I, my consort Lenka and my family wish you all a very happy festive season and best wishes for 2022 with safe flying and blue skies.

FROM THE DESK OF THE DAA

By Liveryman Paul Stone, DAA



The honeymoon period is over. It has been a couple of months of fast learning, delving into lots of fascinating threads of Company activity from Technical Groups, regional activity and other safety and technical related work. First impressions are that there is a healthy amount of high quality

work going on and many areas are making an impact. I have discovered that the Company network is vast and powerful and that the high-quality membership can deliver impartial advice across the full spectrum of aviation topics. I have reflected on the privileged position I find myself in, building a God's eye view of Company activity, and I thought it would be worthwhile explaining what I have learned so far.

I have been getting stuck into the Space, Airspace and Unmanned Air Systems (UAS) Technical Groups (TGs) and all are making great strides.

The Space TG under Freeman Donagh McCullagh's adroit leadership is tackling some big subject areas – loss of GNSS coverage, the impact of space debris, Space Law vs Air law and the impact of rapidly increasing launch rates to name but a few. The TG meetings are enriched by a wealth of engaging and well-informed guest speakers, making it a fascinating working area.

Under Liveryman John Turner's excellent chairmanship, the Airspace TG has gripped the strategic airspace issues in the UK and is providing excellent input into the CAA Airspace Modernisation 'Reset'. It is producing a positioning paper and can provide perhaps the only truly impartial input into the Airspace Change Organising Group (requested by the DfT and CAA, to coordinate delivery of key aspects of the Government's Airspace Modernisation Strategy).

Meanwhile Freeman Ian Davies is doing a great job leading a strong UAS TG examining workshop output on how 'Class L' (unsegregated airspace with UAS operations) may exist in future and using its overseas network to find out how other countries are tackling UAS integration. It is also working with the Airspace TG which has identified a lack of UAS representation in the CAA Airspace Modernisation 'Reset' activity.

Beyond these TGs, members are also supporting other initiatives such as the Aviation Heading Reference Transition Action Group, part of the International

Association of Institutes of Navigation, a further example of how the Company provides experience and technical acumen across the piste.

Turning to the activity in the regions, I was struck by Liveryman Valerie Stait's very frank and open report to the International Technical Forum (ITF) on the impact of Covid-19 from a Hong Kong commercial aviation perspective that really captured the challenges that many members are facing today. From my discussions across the UK and Regions it is clear that different areas are going through different phases right now and it is hard to generalize too far on Covid recovery, but the long-term impact on flight crew is clearly huge and I get the sense that for many members this has been a long period of hunkering down for survival. It is all the more impressive that many areas are so active, and people have still felt it important to contribute to Company initiatives and working groups.

It also re-enforces the importance of the social aspects of the Company and the network of colleagues in supporting the welfare of members. In Australia we have new

members from senior leadership positions in regulatory, and recognized safety organisations which adds gravitas to the region as members grapple with support and input to significant regulatory changes and Airspace transformation. Similarly, the New Zealand region has submitted a paper to the NZ Ministry of Transport on 'Enabling Drone Integration' and considering how to respond to the forthcoming Civil Aviation Authority Bill and the planned Air Navigation System Review. This is why regional input is so valuable to the TGs as the global themes are common to all areas of the Company.

So the Company is buzzing with activity: I haven't managed to touch every technical area and there are plenty of others doing great work that I have not mentioned. But it is clear that the Company is meeting its objectives thanks to the diverse aviation experience and first-class network. I have started to ask TGs and Regions to identify their formal and semi-formal networks to build a deeper understanding of who and how we are liaising and providing advice and consultation. Already the results make impressive reading.



Airspace modernisation is a critical focus of the TGs (NATS)

REGIONAL REPORTS

Australia Region

By Australia Region Chairman Upper Freeman Rob Dicker



November 1st saw a significant change to the status of Australia's international borders with inbound travellers who are fully vaccinated and with a negative Covid-19 test within 72h of departure able to enter through the gateways

of Sydney, Melbourne and Canberra without the requirement for quarantine. Australians will also no longer need to obtain an exemption to leave the country!

This is the first relaxation of Australia's tight international border controls in 20 months and comes on the heels of strong vaccination rates in the south-eastern states. All other states, bar Western Australia, have plans to relax quarantine requirements for both domestic and international arrivals by the middle of December. This has, however, led to the somewhat unusual situation where a Sydney resident will be able to fly to London before being able to fly to Brisbane or Perth!

The flow-on effects of these decisions for Australian carriers have also been significant, with all reporting a surge in both domestic and international bookings. For Qantas and Jetstar, the principal international carriers, this will also mean that all their Australia-based staff will be able to return to work by mid-December. Virgin Australia is a long way from returning to pre-pandemic levels of service, having abandoned its international network early in the pandemic, but will nevertheless be introducing international flights to Fiji in December, followed by Bali and Queenstown, New Zealand.

QANTAS RETURNS

Qantas had previously stated that its A380s would remain in desert storage until at least 2023 but has now announced that two of them will return to service in



QF14 gets ready to depart Buenos Aires (Qantas)



The scene at Darwin (ABC News, Ruby Cornish)

April 2022 to serve Los Angeles with a further three in July 2022 to serve London and all to be back in service by early 2024. Qantas is also looking to bring forward delivery of three brand new 787-9 aircraft, currently in storage with Boeing, several months earlier than planned as demand increases.

Unfortunately, the relaxation of international border restrictions has come too late to enable a visit by the Master. However, we have three formal dinners going ahead in Brisbane, Adelaide and Canberra during November and early December where we will be recognising the recipients of Awards specific to the Australian Region and where the Master will, once again, be making an appearance via video link.

Over the past 20 months Qantas has operated many repatriation flights on behalf of the Australian Government but in October it operated the longest such flight over a unique route. After first flying to Buenos Aires with the Argentine rugby team the B787-9, operating as QF14, departed Buenos Aires for Darwin at 12:44pm local time in Buenos Aires, tracking south of Argentina, skirting the edge of Antarctica before crossing the Australian coast in the middle of the Great Australian Bight and landing in Darwin at 6:39pm local time. The flight took 17 hours and 25 minutes covering a distance of 15,020km, all in daylight, with 107 passengers, 4 pilots and 17 other crew. Why Darwin? Well, that is where the Federal Government's only dedicated quarantine facility is located...

Wishing everyone a joyous festive season with many happy reunions!

Regional Report: North America

By North America Regional Chairman Liveryman Alistair Beaton



On a recent visit to RFC/RAF Air Station Montrose on the east coast of Scotland, I discovered that Canada's most famous fighter pilot Ace of World War 2, Flight Lieutenant George Frederick "Buzz" or "Screwball" Beurling - "The Falcon of Malta" or "The Knight of Malta" - like

so many other RAF fighter pilot aces, had trained at Montrose. Originally RAF Montrose was a Royal Flying Corps Air Station, and the first operational military airfield to be established in the UK, on February 26th, 1913, under the command of Maj C J Burke. A number of Burke's 'sheds' (hangars) are still on the airfield and the Air Station Museum is worth a visit.

George was born in Montreal in 1921 to a Swedish father and a mother of British ancestry. By the age of 17 he had logged 150 flying hours and later qualified as a Commercial Pilot. At the outbreak of war and after a failed attempt to join the Royal Canadian Air Force, Beurling sailed across the Atlantic on a convoy, landing in Glasgow. Intending to enlist in the RAF, he discovered he had forgotten his birth certificate and had to make the return voyage by sea to Montreal and back to the UK before the RAF accepted him for pilot training in September of 1940. He obtained his RAF Wings at No 8 Service Flying Training School, Montrose in 1941.

George was obviously somewhat of a loner, very religious and unconventional. He often demonstrated an anti-authority, devil-may-care attitude, which got him into trouble with his fellow airmen and superior officers. The Air Station Museum volunteer informed me that Beurling was reported to have once walked several miles to the village of St Cyrus in a snowstorm, without proper footwear, impromptu, to ask a lady to marry him! She turned him down... Having said that, while at No 7 OTU, RAF Hawarden, the famed pilot Ginger Lacey commented about Beurling: "There are no two ways about it, he was a wonderful pilot and an even better shot."

Initially Beurling was posted to RCAF 403 Squadron, his first - but uneventful - combat mission flying a Spitfire coming on Christmas Day 1941. In 1942 he was posted to No 249 Squadron RAF Malta, landing on the island on June 9th, after flying off the deck of HMS Eagle aboard his Spitfire, during Operation Salient.

Beurling's Maltese career started on June 12th when,

flying his Spitfire in a formation with three others, he encountered eight Bf109s. He was only credited with damaging one aircraft! However, by July 10th Beurling's kills had risen to five enemy aircraft in four days, officially making him an Ace. By July 27th, he had 14 confirmed kills and was awarded the Distinguished Flying Medal, and soon thereafter he won a Bar:



*"Buzz" Beurling chalks up another victory on his Spitfire
(Department of National Defence, Canada)*

Beurling didn't have it all his own way. On August 8th, 1942, while shooting at a Bf109, he was jumped by two other aircraft and was shot down, belly landing in a stone-walled field but sustaining only superficial cuts to one arm. In the end he was shot down four times over Malta, amazingly surviving with only a few minor injuries.

After several further kills, Beurling was awarded the Distinguished Flying Cross on October 16th, 1942. Shortly thereafter he was sent to Canada to join a Victory Loan Drive, selling war bonds and was a guest of honour at a parade with the Prime Minister, McKenzie King. While in Vancouver he met and married Diane Whittall. In May 1943 George returned to the UK as a Gunnery Instructor at RAF Sutton Bridge, then later transferred to the RCAF. Beurling was credited with 27 kills in just 14 days over the besieged island of Malta and before the war ended, his official kills exceeded 31.

In 1948 Beurling was recruited to fly P51 Mustangs for the Israeli Air Force, but during a test flight on 20th May he crashed a Noorduyn Norseman transport aircraft while landing at Rome Airport. This was his 10th crash, and there was a suspicion of sabotage, but this was never proven. Sadly The Falcon of Malta was killed and his body burnt beyond recognition. Three years after his death he was finally buried at the foot of Mount Carmel.



Regional Report: Hong Kong

By Hong Kong Region Chairman Court Assistant Pat Voigt



The players

Following the socially fallow year preceding our junk boat voyages in July, the Social Team, headed by Upper Freeman Jason Cavé, has been very busy planning as active a calendar for the remainder of the year as both restrictions and rosters will permit.

The venue, players, croupiers, catering and prizes were all in place for our inaugural Casino Night, aptly named 'Aces High', to be held on Saturday 9th October. Throughout the summer, Hong Kong had been spared the usual disruptions to both aviation and general living, with barely a whisper of "typhoons". Unfortunately, with typically poor timing, Typhoon Lionrock roared into life on the morning of the 9th and the Observatory raised its first T8 signal of the year. The decision to call off our event was finally taken at 1600, much to the disappointment of all concerned.

With exceptional efforts the team immediately began preparations for its resurrection only two weeks hence. The logistics of this task, considering the previous months

of planning, including roster requests by members and guests, was huge. However, in true aviation fashion and with Air Pilots' determination, we rolled the dice and Aces High launched on the evening of Saturday 23rd October, continuing well into Sunday's early hours.

Despite the extremely short notice, the event was attended to capacity and proved to be a massive hit. We were very fortunate to have received generous prizes from associated businesses, ranging from several food and beverage items, cookery school lessons and timepiece accessories, to sports physiotherapy vouchers, all of which significantly added to our Air Pilots merchandise range.

As a firm believer in the adage that 'a picture paints a thousand words', I have embedded within this article a smattering of images from the night.



Intense action at the tables

I must take this opportunity to thank the Hong Kong membership for their unstinting support of our Region and also to welcome the 'new joiners' who continue to swell our numbers or at least ameliorate the sad but inevitable departure of some.

In closing, as I write this article on Halloween night from my quarantine hotel in Sydney, I am aware that by the time you read it, we should have been about to hold our Regional Formal Christmas Banquet. Therefore, I wish the entire membership of the Honourable Company of Air Pilots a very Happy Christmas, in anticipation of a much-improved 2022.



Young Air Pilot Update

By Freeman William Wright – YAP Committee Chair



I was recently operating a flight from Glasgow to London Luton airport. The Captain had just positioned up from London Gatwick, slightly unusual but perhaps due to COP26 taking place, extra capacity was required. Anyway, we had some mutual

interests and got chatting about the Air Pilots. What struck me during that flight is that we have members everywhere and often, they are as engaged with aviation and as passionate about the future of the industry as I am. We chatted about young members, their place within the future of the company, and what we've been up to recently. As I was speaking it dawned on me that we are really progressing with our aim of having an integrated and enthusiastic Young Members' section. I'd like to mention two events that highlight this.

THE GREEN AVIATION EVENT.

As you will have read in my last update, we were invited to support the Environment Working Group on the delivery of its Green Aviation event. Industry stakeholders came together in Glaziers Hall to discuss perspective, associated challenges, and a possible roadmap to achieving Net Zero. We had four young members in attendance on the day, and all contributed significantly to both the overall conversation and the successful outcomes of the day. Not only was it great exposure for those supporting but it demonstrates the ability of young people to have their say on current aviation affairs. This is so important, in my opinion, as it is this generation who will be the decision makers of tomorrow.

T&A.

The significant social event of the Air Pilots calendar did not disappoint and also serves to illustrate the growing strength of the young members. Supported by the Company, we had an allocation of ten specific young member spaces for the event. We happily filled those spaces within days of the application being sent. In fact, we ended up being well oversubscribed! There were also several other young members in attendance who had booked directly through normal channels – so we were very well represented indeed. Further, you may notice that the introduction to the T&A report in this edition of Air Pilot was written by Young Air Pilots Stephen Daly and Freddie Bull. It is wonderful to see contributions in the magazine coming from the young members.

It is also worth noting some other recent and upcoming events. Pilot Careers Live was due to run on 6th November, followed by a small post-event social. We will have been supporting Assistant Steve Durrell and his promotions team to give words of advice and encouragement to future Air Pilots. I'm sure it goes without saying, but it remains a tricky time within aviation - particularly for those passionate prospective aviators who are still trying to break into the industry. As an organisation we have done great work in the past to support these people and events like this. I have no doubt that we will continue this at PCL and beyond.



Young Air Pilots were out in strength at the T&A Banquet

On this theme, we have also been involved in developing an interview training day to further support those who may need their interview skills polishing. The day will serve to support anyone actively seeking a job and to form a complete package for an airline application process with simulator assessment and aptitude test included. Compared with market products it will represent considerable value and any monies raised over and above running costs will be donated to our successful scholarships programme in a rather satisfying 'sustainability circular'. We have been well supported by TurnPoint and the University of West London, with whom we have worked in the past and who have provided their services and facilities free of charge. The preliminary dates are set for the end of January.

All the above serves to illustrate my original point and the message I want you to leave with following this update. We are seeing change within the Young Member community that began with Immediate Past Master John Towell, continues with current master Nick Goodwyn and that is wholeheartedly supported by the Learned Clerk and Office. I very much look forward to the continuing trend of Young Members who exemplify Air Pilots values.

Blue skies and tailwinds.

AIR PILOTS SCHOOLS GLIDING SCHEME

By Assistant Zoë Gell



The Air Pilots Schools Gliding Scheme is open to pupils from secondary schools and academies and offers heavily subsidised gliding days at local British Gliding Association (BGA) gliding centres. Since 2004, over 1,500 youngsters have taken to the skies in a twin-seat glider under the watchful

eye of their instructor. The gliding is the highlight of the calendar year for many schools, which describe it as a life-changing experience for their pupils and a fantastic way to inspire and reward their most hard-working students for their efforts throughout the year.

"We teach some of the most disadvantaged young people in the country and having the opportunity to go up in a glider will have broadened their horizons - both literally and figuratively speaking - more than anything else they'll have been offered through school before."

King Ethelbert School

Although the scheme officially offers each pupil a flight in a glider, it offers them so much more than just the flight itself. The day involves a trip away from school to a busy airfield where they interact with aviation enthusiasts and volunteers. The experience ignites a spark of enthusiasm in every student who takes part and, for many of these students, it is an opportunity which would not be available to them without Livery Company support. Often, the schools taking part have a high proportion of students from disadvantaged backgrounds with many of their pupils receiving free school meals vouchers. The schools gliding scheme introduces youngsters to the world of aviation at an early age; on a more generic level, gliding is the vehicle for inspiring and encouraging youngsters through Livery Company charitable activity. The scheme is kindly supported by the Air Pilots Benevolent Fund, with several other Livery Companies also providing funding for schools.

A full programme of schools gliding had been planned for 2020 but, regrettably and as was the case with so many activities, this was cancelled due to the Coronavirus pandemic. The gliding clubs faced significant challenges in reopening to their members, regaining currency for their instructors and addressing the backlog of trial lessons and member flying which had built up during lockdowns. The difficulties faced by schools has been well-documented



Schools gliding benefits students from diverse backgrounds

and their pupils have suffered enormous disruption to their schooling. With that in mind, and with the likely possibility of further lockdowns/restrictions, a gliding programme for schools was tentatively planned for summer 2021 in the hope that something positive could be offered for the pupils.

Cambridge Gliding Centre, which was new to the scheme this year, kindly offered two weeks for groups from schools to go gliding on the proviso that: "If we can, we will". Despite the pressure on teachers during the reopening of schools and the difficulties in fitting extra-curricular activities into the calendar, the scheme was fully booked within an hour of opening and a waiting list was started. This gives some indication of just how valuable and important the scheme is to the schools who take part and what a fantastic opportunity it is for their pupils.

"The students had a wonderful time at the centre: for many of our students this is a real moment in their life's journey and this experience will give them a real something they would not normally be able to access."

George Green's School

The two gliding weeks in July and September were a resounding success and feedback from the schools was extremely positive. Overall, 124 students were flown, including 20 in the simulator due to a bad weather day. A remarkable achievement and the Air Pilots is immensely grateful to Cambridge Gliding Centre.

Planning is already underway for schools gliding in summer 2022 and it is hoped that gliding can be offered by several BGA gliding centres around the London/Cambridge area. Traditionally, schools have often joined the scheme after learning of the opportunities through speaking to Air Pilots members. If you know of a school who would like to take part, then please ask them to contact the office. We would be delighted to hear from them.

THE TROPHIES AND AWARDS BANQUET 2021

By Associates Stephen Daly and Freddie Bull

Many of us are 'old hands' at Company events and perhaps sometimes take the spectacle for granted. We therefore thought it appropriate to ask some of our Young Air Pilots to provide this introduction to this most important of Air Pilot events and their first experience at the Guildhall.



The Master, IPM and their consorts receive diners

On 21st October 2021, some 440 members of the Honourable Company of Air Pilots and their guests gathered in the breath-taking beauty of the Guildhall, in the centre of London, for the annual Trophies and Awards Banquet. The venue is an architectural marvel, whose finished construction date precedes the first flight by over 450 years. A secular stone building built in 1411, the Guildhall is the only building of its type to have survived both the Great Fire of London and the Blitz. The building plays a central role in London-based Government, having entertained state visitors and Royalty for centuries. Pictures exist of both banquets with Queen Victoria and the infamous trial of Lady Jane Grey taking place within the basilica-like structure.

The Banquet itself took place in the aptly named 'Great Hall', a room with several monuments amongst its stained-glass windows and chandeliers including those to Winston Churchill, Admiral Lord Nelson, and the Duke of Wellington. This rich history, combined with



The Guildhall pikemen were popular photo subjects

the attendance of several Past Masters, Red Arrows, Concorde Captains and Guest of Honour Air Marshal Gerry Mayhew CBE amongst many distinguished guests, made it feel as if the awards night was taking place on the shoulders of giants. It is a great honour for the company to continue to be permitted to hold the Trophies and Awards Banquet in the Guildhall.

Presentation of awards was preceded by an excellent three course meal. Live music, played beautifully by the London Banqueting Orchestra, filled the Great Hall adding to the cathedral-like ambience.

The Trophies and Awards themselves were as diverse as they were impressive with awards being given to recipients from forms of aviation ranging from vintage flying to Virgin Galactic. It was incredibly humbling and inspiring to be in the presence of so many remarkable aviation professionals. We implore you to read further on the incredible achievements of all the award winners.



The wonderful sight of the Guildhall full of Air Pilots and guests



The London Banqueting Ensemble give the posthorns a work-out



Gp Capt Adrian Maso RAAF, Air Advisor, receives the RAAF Centenary Sword



The Guest of Honour, AM Gerry Mayhew CBE, appreciates the Master's introduction



The Master speaks



The Young Air Pilots were enjoying their evening

At a special Court Meeting before the Banquet, seven new Liverymen were clothed, and three Master Air Pilots and two Master Rear Crew received their certificates.



(L-R) New Liverymen Oliver Russell, AVM Ian Morrison CBE (Ret'd), Capt Ameen Budagher, Capt Kristina Tervo, Capt Peter Taylor, Flt Lt Jonathan Hill, Martin Hatton



(L-R) MAP Steve Price cfs, MAP Paul Smiddy, MAP David Cockburn, The Master, MRC WO1 Richard Byrne, MRC Kevin Weller

THE TROPHIES & AWARDS 2021

The Company's Trophies and Awards for 2021 were presented – along with those for 2020 which were reported on in Air Pilot December 2020 but which were unable to be presented because of the pandemic – at London's Guildhall on 21st October.



THE AWARD OF HONOUR

MARTIN BAKER AIRCRAFT COMPANY LTD



Martin Baker is a British family-run business, which started as an aircraft manufacturer and has become a global pioneer in aviation safety. Best known for its development of the ejection seat starting with a test ejection in 1945, Martin Baker has delivered over 70,000 seats to 93 air forces worldwide and, to date, saved over 7,660 lives. For a truly enduring contribution to aviation, Martin Baker is a thoroughly deserving recipient of the Award of Honour.

THE JOHN LANDYMORE TROPHY

Awarded each year to the outstanding candidate in the PPL Scholarship programme.

ANNE SOLTOW



From the initial impression that she made upon the scholarship selection committee to the approach she adopted during her flying training for her PPL, Anne has demonstrated exemplary personal qualities and a professional, competent approach to flying.

THE GLOVER TROPHY

Awarded to the most meritorious student pilot graduating from a school of civil or military aviation.

CAPTAIN JAMES LOWREY AAC



Captain James Lowrey demonstrated exceptional levels of commitment and skill on his Army Pilots course and was recognised as the 'Best Student' and 'Top Tactics Student' on the testing Operational Training Phase (OTP). Most impressive of all was Captain Lowrey's performance on the Apache Conversion-To-Role course when his performance was outstanding and by no means typical of the usual output standard.

THE HUGH FIELD AWARD FOR AVIATION JOURNALISM

Awarded for an outstanding contribution to the promotion or public awareness of aviation.

ARTHUR WILLIAMS



Arthur received his first specialist journalism commission to present an hour-long film on the de Havilland Mosquito, called *The Plane that Saved Britain*. For this, he was nominated for a Grierson award for 'Best Documentary presenter'. He has since presented

a four-part series called *Flying Across Britain*, concentrating on GA in the UK and presenting a very positive view of flying in Britain. Arthur Williams is an inspiration.

THE PIKE TROPHY

PRIMO LONZARDI



Primo Lonzardi is a legendary flying instructor and examiner around the Northwest of England, and beyond. Having migrated to the UK from Italy in 1970, he has spent the last 50 years flying light aircraft, instructing and examining at various locations around the UK. Today, he continues to delay a well-earned retirement and can be found still travelling around examining new and existing Flying Instructors. He is a stalwart of general aviation and flying instruction in the UK.

THE GRAND MASTER'S MEDAL

Awarded to an individual under the age of 30 for outstanding achievement in aviation.

FLIGHT LIEUTENANT RYAN STOWE RAF



Fl Lt Ryan Stowe's extraordinary contribution to Chinook Force operations in a relatively short space of time is highly impressive. Stowe's contribution to combat operations sets him apart from his peers. He has also led multiple exercises at home and abroad. An outstanding example was his delivery and execution last year of the largest single Rotary Wing lift by the British Army - executed immaculately by this impressive young officer.

THE JOHNSTON MEMORIAL TROPHY

RAF SENTINEL FORCE



The Raytheon Sentinel was introduced into Royal Air Force service with V (Army Co-operation) Sqn in 2007 before flying its first operational mission in 2008 on 'Op Herrick' over Afghanistan, offering clear and timely understanding of the ground environment through an airborne stand-off radar capability. In January 2021, the Sentinel flew its final deployed operational sortie from Cyprus on 'OP Shader' – the UK's contribution to the Counter-Daesh Coalition in Iraq and Syria. By any standard, the Sentinel squadron's achievements have been consistently remarkable. With an unmatched serviceability record, it has flown over 32,000h in almost 5,000 sorties, the majority being on operations.

THE SIR BARNES WALLIS MEDAL

SQUADRON LEADER JAMES SKINNER RAF



Sq Ldr James Skinner is responsible for implementing and monitoring policy, tactics and standards that lead to the safe and operationally effective execution of Typhoon operations. Through syllabi of his design, he is responsible to the RAF Combat Air Force Commander for assuring RAF Typhoons are ready and capable to conduct the myriad of air power roles of which the Typhoon is capable. As a result of Skinner's innovative approach, the Typhoon Force has undergone a significant training mindset shift, shortening time to Combat Ready status whilst simultaneously improving the lethality of frontline pilots. His skilful use of training resource also embraces the ethos of the RAF's Astra campaign to build a Next-Generation air force.

THE GRAND MASTER'S AUSTRALIAN MEDAL

FLIGHT LIEUTENANT LAURA ASHLEIGH HAWS RAAF



Fl Lt Haws is an Engineering Staff Officer within Headquarters Air Combat Group, currently supporting F/A-18F Super Hornet and EA-18G Growler maintenance, logistics and engineering for Number 82 Wing at RAAF Base Amberley. Her primary role is to oversee the fleet management of 35 Super Hornet and Growler aircraft. Fl Lt Haws engenders the respect of subordinates through her personal demonstration of genuine concern for their well-being. She communicates confidently, openly and warmly and in doing so generates great rapport with her colleagues, leading to better outcomes developed in a harmonious and cohesive work environment. Her deep and considered thinking about problems and her outstanding support to aviation outcomes are commendable.

THE AUSTRALIAN BI-CENTENNIAL AWARD



FLIGHT LIEUTENANT GEOFFREY FOX RAAF

Fl Lt Fox is a specialist aircrew officer and flying instructor of the highest calibre. His dedication to pilot training and standardisation whilst flying the Boeing 737-8BBJ at Number 34 Squadron have upheld the exacting standards

required in the provision of VIP transport in support of the Government of Australia. His dedication to the provision of VIP transport training and standardisation are of the highest order and in keeping with the traditions of Number 34 Squadron and the Royal Australian Air Force.

THE CAPTAIN JOHN ASHTON MEMORIAL AWARD

ROYAL FLYING DOCTOR SERVICE QUEENSLAND SECTION



The Royal Flying Doctor Service Queensland Section (RFDSQ) transported 11,700 patients in the last calendar year, logging just on 28,200 flight hours for the period. From eight bases in Queensland, the area of operation encompasses remote and regional Australia with operations to unimproved surfaces, including road landing sites, as well as international airports. The RFDSQ has been in operation for 92 years and is a world-class aeromedical provider serving the Queensland and Australian community. The RFDSQ and its Flight Standards Team are recognised for their outstanding contribution to flight standards and aviation safety within Australia.

THE JEAN BATTEN MEMORIAL AWARD



SIR PETER JACKSON ONZ KNZM

Sir Peter is an exceptional person, with an incredible passion for World War One aircraft. With his company's collection (The Vintage Aviator – or TVA) of over 50 aircraft, he has, almost single-handedly, pioneered the resurgence in interest in both World War One (with his

colourised film *They Shall Not Grow Old*) and its aircraft. Sir Peter's purpose for the collection is to recreate and commemorate history and to display it to the general public. It is without doubt, that were it not for Sir Peter, many of these aircraft would be lost to time and numerous museums around the world, including the RAF Museum, would not have examples on display.

THE SWORD OF HONOUR

STUART McKAY



Stuart McKay was founding secretary of the de Havilland Moth Club (DHMC) and is a world acknowledged expert on the de Havilland Tiger Moth, especially in relation to its history. Stuart, having founded the DHMC in 1975, is still the club secretary in 2021, a period of 46 years' service to the club. Stuart also encourages young engineers to learn the skills and knowledge required to keep vintage aircraft flying, as without such skills, such aircraft would cease to fly. There can be no doubt about Stuart's contribution over many years to the field of aviation. Stuart is a true gentleman, whose enthusiasm toward aviation is infectious.

THE MYLES BICKERTON TROPHY

JOHN STIRK



John Stirk took his first flight, aged 10, in 1947, in a BA Swallow and joined the ATC three years later, progressing to Sergeant. In 1959, he became a founder member of Doncaster Gliding Club, then without a site or gliders. In 1983 John oversaw the move to Burn airfield where

he was Chairman for 14 years. He was a committee member at both clubs until 2010. John has always been keen to promote gliding and encouraging people to gain confidence in their own ability while working together with others. He resigned as a gliding instructor in 2019 but he is still flying and has just passed solo again for flying in gliders. He has flown 61 different glider types, with a total of 3563h. His total launches number 11,304 - most of which were giving instruction - plus over 980h power flying in 11 aircraft types, including glider towing. John Stirk is a remarkable aviator, administrator and instructor, who has selflessly given so much to help so many hundreds of people achieve their dreams and fulfil their previously unknown potential

THE DERRY AND RICHARDS MEMORIAL MEDAL

KELLY LATIMER



Kelly is a former USAF pilot, having served over 20 years in the military as a pilot and test pilot. She flew operationally on the Lockheed C141, as a pilot and instructor; as well as instructor on the Northrop T38, prior to attending Test Pilot's School (TPS). She then went on to fly and evaluate the Boeing C-17 and C141 as a test pilot, following that tour with an instructional tour at TPS. Kelly has over 6,800 flying hours in more than 50 different types and is a distinguished Test Pilot and leader as exemplified by her military and civil achievements. However, this year she was instrumental in leading the Virgin Orbit LauncherOne team from the early initial design and operational phase, through to its successful rocket launch of 10 mini 'cubesats' into orbit in January 2021. She is considered by her peers to be an outstanding aviator and manager and an inspiration to the team who work for her. Women, worldwide, will be inspired by her achievement and for her effortless skills in leading teams to integrate, taking programmes through to completion with safety as a prime prerogative.

THE ERIC 'WINKLE' BROWN MEMORIAL TROPHY

CAPTAIN RICHARD DANE OBE



An enormously experienced pilot and leader in aviation, Capt Richard 'Tricky' Dane has amassed over 8,000h flying with 6,000h as pilot in command on 27 types ranging from single and multi-engine rotary and fixed-wing including tilt-rotor aircraft. His 37-year aviation career (1984-present) has spanned operational, instructional, examining and test and evaluation roles. It was his work in senior management positions in Royal Navy and commercial aviation however, that saw the results of his exceptional ability in influencing aviation processes for the better. He has been a force for good in all areas of aviation - training, test, safety, standards and assurance. Not only is he a very much revered aviator in military and civilian circles, he has left behind a tangible legacy in the very fabric and culture of RN Merlin, USMC/AF Tiltrotor, and Commercial S92 and AW189 SAR Operations.

THE MASTER'S COMMENDATION



MAJOR KEVIN ANDERSON AAC

Maj Anderson is an exceptionally experienced A2 Qualified Helicopter Instructor (QHI), instrumental in the development of peers and

subordinates across Army Aviation. This Commendation marks 30 years and some 6,000 flying hours across five helicopter platforms and dedication to aviation instruction and assurance. He is truly a master in his field. Major Anderson's full military aviation career is an exemplary display of selfless commitment and dedication. He is an experienced operator, truly professional and a highly capable instructor. As a leader, coach and mentor he has been pivotal in the development of subordinates and peers across a wide range of platforms. His service record and contribution to UK Defence have been outstanding.

THE CENTRAL FLYING SCHOOL TROPHY

FLIGHT LIEUTENANT JAMES HOBKIRK RAF

Fl Lt James Hobkirk has displayed exceptional dedication to helicopter flying, instruction and examination across a variety of RAF and Tri-Service Units for 32 years. He has amassed in excess of 7,000 flying hours; qualified on seven types of fixed and rotary wing aircraft and an additional three types on which he has examined. His rotary wing experience in the British forces is unparalleled. As an instructor and an examiner, he has operated in the tri-service environment with distinction and pride and made an immense aggregate contribution to military aviation instruction, both on operations overseas and in the UK.



THE CUMBERBATCH TROPHY



TIMOTHY TUCKER

In 1982 the founder of Robinson Helicopters, Frank Robinson, was delighted that a large proportion of sales were to pilots who had been taught on the R22 (his first design) and then

decided to buy, so they were in general very-low-hour pilots. He had the foresight to realise that it was essential for the continuing success of his fledgling company building this relatively cheap machine, to ensure that the pilots were properly trained both at the initial stage but, just as importantly, on a continuing basis. Tim Tucker purchased R22 s/n 003 for his helicopter flight school, and almost immediately Frank appointed him to start, and then run until this present day, some 35 years later, the very well-regarded Robinson factory-sponsored four-day Safety Course. Tim has now had over 18,000 attendees on these courses. In addition to his distinguished work with Robinson, Tim has authored many articles and books on safety and has received several prestigious awards and four FAA Certificates of Recognition. He has been instrumental in promoting the Vuichard technique for vortex ring recovery, a major cause of helicopter accidents. Over his 37 years with the US Army (active and reserve) he achieved a multitude of awards and decorations, and sits on the US Helicopter Safety Team Executive Committee. The richness and depth of his 'Tim Tucker's Helicopter World' website gives the reader an insight into the concepts and principles that Tim continues to expound.

THE SIR JAMES MARTIN AWARD GARMIN LTD



Founded in 1989 in Lenexa, Kansas (USA), Garmin has grown over the last 31 years to become a preeminent maker of avionics. Today, Garmin avionics can be found in general aviation and business aircraft all over the world. In development since 2011, Autoland was certified by the FAA in May 2020 on the Piper M600 and the Cirrus Vision Jet. Garmin Autoland will ultimately be scalable down to G1000 equipped aircraft, and scalable up to G5000 equipped aircraft. Thanks to innovations such as Autoland, Garmin continues to be a worldwide leader in avionics development. There can be no doubt, that Autoland, will be a life saver in years to come.

THE MASTER'S MEDAL



LIEUTENANT COLONEL ADAM THORNTON USAF

Lt Col Adam "Blade" Thornton's skill as Commander, 79th Fighter Squadron, and as an experienced F-16 Instructor Pilot, were tested in combat on 11th December 2019 at Bagram Air Base,

Afghanistan during an attack by the Haqqani network. At approximately 06:00, Haqqani network fighters detonated a 2,500lb (1,135kg) vehicle-borne explosive device against the perimeter fence of Bagram Air Base, allowing attackers, heavily armed with rocket propelled grenades, mortars, heavy machine guns, and suicide vests, to enter the base. While the base was still under fire, Lt Col Thornton and his wingman launched their F16s and co-ordinated in real-time with the Bagram tower controller and the Joint Terminal Attack Controller to launch directly into the fight. For three hours, Lt Col Thornton monitored the dynamic ground situation, relayed movement of the Haqqani fighters and executed "yo-yo" tanker operations to ensure one F-16 remained overhead at all times, while simultaneously developing multiple attack options for the ground commander. As a result of the mission, all enemy attackers were eliminated.

THE MASTER'S MEDAL



FLIGHT LIEUTENANT MATTHEW DOUGLAS RAF

On 8th July 2020, Flt Lt Douglas was the leader of a pair of Typhoons flying a night-time mission over Iraq. Operating over an hour's flight from their home base on a moonless night, they were reliant on air-to-air refuelling to complete

their task of providing armed overwatch of an Iraqi air base. Thirty minutes into the task his internal cockpit lights failed fully bright, causing dazzling glare. Simultaneously his external lights failed off, increasing the risk of mid-air collision with another aircraft in theatre. However, noting the significant threat to ground forces that night, he selflessly put their protection first and with careful mitigation, he continued to provide air support. Over the

ensuing hour Douglas' aircraft suffered increasingly severe electrical failures, culminating in indications of an aircraft ladder having deployed directly in front of his intakes.

With potential engine damage, Flt Lt Douglas had no choice but to divert to the very air base he was charged with protecting, despite the increased threat of attack. Declaring an in-flight emergency, he commenced his descent. At this point his radios began to fail and he lost control of the critical fuel system. With utter professionalism and exceptional airmanship, he remained unfazed and descended into the threat envelope for a precautionary single-engine landing. Safely down and parked up, he attempted to open his canopy. Due to the electrical failures, it remained firmly locked. He was now trapped in a cockpit with an ambient temperature of 41°C and no cooling. Jettisoning the canopy risked death to anyone it struck, so he calmly explained to air traffic control the nature of his predicament, drawing diagrams on scraps of paper to show the groundcrew how to attempt assistance. After eight hours in the cockpit, as the internal temperature became dangerously high, Flt Lt Douglas asked fire crews to attempt to cut him free rather than risk jettisoning the canopy. During this traumatic event, he showed exceptional bravery despite escalating danger, intent on saving his aircraft and limiting the risk to those he was charged to protect.

THE GRAND MASTER'S AWARD CREW OF NZ3301



On 9th December 2019, White Island in New Zealand erupted while up to 50 tourists were visiting the island, killing 22 people. On 13th December, Flt Lt Reichardt and his NH Industries NH90 crew were tasked in support of the Police-led body recovery operation. The weather conditions were not favourable, with a westerly wind holding the main gas and steam cloud within the main crater, creating a cloud base of around 600ft. Every three to five minutes there was a gas explosion, which would envelope most of the main crater area making flight dangerous. Despite these risks, and the known possibility of encountering poisonous and corrosive gases for which no PPE was available, Flt Lt Reichardt and his crew

volunteered to undertake the recovery mission. In doing so, they developed a plan to operate within the crater in cycles, moving clear when personal irritation became significant, the effects of the gas were noticeable, or the gas cloud forced them from the crater. This was a task of national significance, and the pressure on the entire recovery operation to provide closure for the victims' families and the wider New Zealand public was immense. While under significant pressure and scrutiny throughout the recovery operation, Flt Lt Reichardt and his crew consistently displayed sound judgement and flexibility, exceptional crew coordination and pure flying skills of the highest standards. Noting the significant and unpredictable risks involved, the crew also demonstrated exceptional courage in the conduct of this operation.

THE HUGH GORDON-BURGE MEMORIAL AWARD CREW OF TALON 42



The crew of Talon 42 distinguished themselves by extraordinary achievement in support of 'Op Inherent Resolve' on 7th-8th January 2020. During this time, the aircrew of *Talon 42* courageously operated their Lockheed MC-130H in a degraded state to evacuate military personnel from a base in Iraq, under threat from Iranian ballistic missiles. While enroute to the air base, the MC-130H experienced an entire loss of avionics and navigational capabilities due to complete computer failure within the aircraft. After handling initial actions for the emergency, the crew determined the extreme priority of the mission outweighed the technical-order guidance, which suggested mission termination. Upon landing at the Iraqi air base, the crew of *Talon 42* loaded 93 personnel and cargo, 37 more than technical guidance allows, which made fuel requirements more critical. After take-off, challenges further compounded when the aircraft's intended point of landing, Ali Al Salem Air Base, was reported to be under threat of imminent attack. With no aerial refuelling options available, *Talon 42*'s crew made the decision to immediately divert to Kuwait International

Airport. After having safely landed and refuelled, they were notified that Ali Al Salem was cleared of the missile threat, so the crew proceeded there to disembark the rescued personnel. *Talon 42* completed this planned 16h mission in under 12h, and their quick thinking and superior airmanship resulted in the safety from imminent Iranian attack of a total of 101 Joint Special Operations Forces personnel during that period of darkness.

THE PRINCE PHILIP HELICOPTER RESCUE AWARD CREWS OF SCHOONER 20 and MAKO 27



On 5th September 2020, a massive and rapidly growing wildfire in California raged. With reports of 30 people trapped by the fire and facing a gruesome death, an immediate air-evac was required due to fire, smoke and debris making roads impassable. National Guard aircrews *Schooner 20* (Boeing CH47 Chinook) and *Mako 27* (Sikorsky UH60 Black Hawk) were tasked for the mission and prepared to execute a hasty night search and rescue in the middle of an uncontrolled, rapidly moving, extremely hazardous wildfire. While approaching the rescue location, raging fire and dense smoke caused *Mako 27* to lose sight of *Schooner 20*. Rather than abort the mission and abandon those trapped and facing a fiery death, the flight split, with each aircraft using different routes and pick-up locations. During split-flight operations, the two crews made radio calls each half mile to ensure they were safely sequenced and executing the mission. As the aircraft entered the rescue area, smoke obscured the terrain, fire was rampaging unchecked in all quadrants, and the aircrew were breathing noxious smoke. Imagine the aircrews' surprise when they discovered that hundreds of people, not 30 as expected, were clamouring for rescue. This was a scene straight out of Dante's *Inferno*. Unable to carry all the potential evacuees in a single lift, the crews returned to base, quickly off-loaded evacuees, refuelled and promptly headed back to conduct additional rescues. In the face of daunting environmental conditions and physiological hazards to aircrew, the gallantry and skill of *Schooner 20* and *Mako 27* saved 263 people and 16 dogs.

The following awards have also been made by the Company's regions for 2021

THE MASTER'S TROPHY FOR THE NORTH AMERICA REGION

CIVIL AIR PATROL - USAF AUXILIARY



Entering its 80th year, the Civil Air Patrol (CAP) has consistently served as a vigilant organisation of citizen Airmen committed to assisting the public.

Founded on 1st December 1942 to mobilize America's civilian aviation resources for national defense service, CAP has evolved into a premier public service organisation, still carrying out emergency service missions when needed both in the air and on the ground.

As a Total Force partner and Auxiliary of the USAF, CAP is there to search for the lost, provide comfort in times of disaster and work to keep the homeland safe. Its 60,000 members devote their time, energy and expertise toward the well-being of their communities, while also promoting aviation through aerospace/STEM education and helping shape future leaders through CAP's cadet programme. CAP fields one of the largest fleets of single-engine piston aircraft in the world.

During the COVID-19 pandemic In 2020, CAP embarked on its largest service campaign since its founding. At first, missions were basic - taking aerial photographs of temporary drive-through testing facilities to document traffic flow. Later came requests to transport test kits along with other missions assigned by the Air Force, some of which required new processes and procedures, such as sanitising vehicles between missions.

Later in 2020, CAP was tasked with delivering personal protective equipment (PPE) to rural locations, building temporary hospitals and other facilities, staffing emergency operations centres, delivering or serving meals, making PPE, hauling mobile command centres, expediting test

samples to labs, conducting aerial photography and using unit locations for blood drives for the American Red Cross. By the end of the year, CAP was tasked with assisting in distribution of vaccines to remote areas such as Native American reservations.

CAP's COVID response was conducted whilst carrying out 90% of inland search and rescue in the USA as tasked by the Air Force Rescue Coordination Center and other agencies. During the Fiscal Year 2020, CAP units were credited with 130 saves and 107 in 2021. Following Hurricane Ida, members assisted in collecting and processing damage assessment information for the Federal Emergency Management Agency, aiding the focus and speed of its response.

MASTER'S TROPHY FOR THE AUSTRALIAN REGION

ADRIANNE CLAIRE FLEMING OAM



Adrianne Fleming learned to fly in the late 1980s whilst working for the Civil Aviation Authority as an Airways Systems Data Officer. By August 1993, aged just 24, she had advanced to hold a Commercial Pilot Licence and Grade 1 Flight Instructor rating, and with her husband Geoff, opened her own flying school, Tristar Aviation, at Moorabbin airport in Melbourne.

Over the years Adrianne became known as a specialist in training methodology. The school expanded with a staff of 12 instructors offering approved courses to Australian and overseas students.

Adrianne has been the Executive Commissioner for the Australian Air League in Victoria for more than 10 years, promoting aviation as a career option to young men and women. For this and her other work she was awarded

the Nancy-Bird Walton Memorial Trophy granted by the Australian Women Pilots' Association for a most noteworthy contribution to aviation by a woman in Australasia.

In 2016, Adrienne was invested with the Order of Australia Medal (OAM) for services to aviation.

She is a board member of the Professional Aviation Board of Certification, is the Scholarship Coordinator for the Australian chapter of Women in Aviation, offering mentoring, networking and education opportunities to women interested in careers in aviation. Since 2019 she has served on CASA's Aviation Safety Advisory Panel, with particular reference to flight training.



MASTER'S TROPHY FOR THE HONG KONG REGION

SID KWONG

Sid Kwong is an experienced aviator and qualified lawyer. Born in Australia in 1982 and educated in the United Kingdom, Sid read law at the University of London. He joined

Cathay Pacific Airways as a cadet pilot at Flight Training Adelaide graduating in 2005.

Sid joined the Cathay Pacific Airbus fleet as a second officer and three years later was promoted to first officer. In 2015 Sid took the difficult decision to temporarily suspend his flying career to further his legal ambitions by taking the Bar in London.

Returning to Hong Kong in 2017 he rejoined Hong Kong Airlines as a first officer on the long haul A330. In 2020, Sid moved to Hong Kong Express as a first officer on the A320, where he is now awaiting the recovery of our aviation sector to recommence his flying career.

Sid joined GAPAN in 2006 and quickly became an active member, throwing himself into organising activities before joining the General Committee and becoming Vice Chairman of the Youth Flying Scholarship. It is in this role that he has proved especially adept, harnessing his natural negotiating skills to secure ongoing sponsorship for the programme.

Sid took the Livery of the Company in 2018 and has consistently been an extremely valuable member of the region. His experience and expertise as a pilot, helping and encouraging the youth of Hong Kong to follow and in many cases choose aviation as a career, has been exemplary. Sid's knowledge of the law has assisted and guided our General Committee for many years.



A final reminder of the pleasure of being able to gather again in large numbers: the pre-T&A Banquet reception

THE GREEN AVIATION EVENT

Report by The Editor

The Green Aviation Event co-organised by the Company and the Worshipful Company of Scientific Instrument Makers (WCSIM) on 25th October saw around 100 delegates treated to a wide-ranging examination of the issues around decarbonising aviation, with particular attention on how the City could help to enable the move to Net Zero by 2050. The successful event was the culmination of months of hard work led by the Company's Lead on Environment and Aviation Sustainability, Robert Seaman, and Warden John Denyer.



The Master welcomes delegates Opening the event, Master Nick Goodwyn reminded attendees of the Company's role in striving to protect the interests of pilots through effective engagement with regulators. A particular concern was what while aviation was a large – but not the largest – emitter now, as other sectors reduced their carbon emissions aviation would be seen to be a bigger emitter in percentage terms. There was lots of coverage of the technologies of decarbonisation, but less of finance, governments and pilots. The Air Pilots was in a unique position in aviation and the City and its ability to bring the two together.

Charles Holroyd, IPM of the WCSIM, in his opening remarks stated that: "The world has witnessed five major extinctions – we do not want to preside over the sixth."



The Master Scientific Instrument Maker, Charles Holroyd

The Lord Mayor, acknowledging the fact that decarbonising the aviation sector was a vital part of tackling climate change, was keen to emphasise the City's credentials in already tackling its own performance through its Climate Action Strategy. This called for net zero in the city by 2040, with the City Corporation itself achieving net zero by 2027 at a cost of £68million

He also neatly reflected on the conflicting tensions of aviation and the environment with two quotations: "I wish to place on record my regret that mankind ever learned to fly" (Sir Winston Churchill) and "Once you have tasted flight you will forever walk with your eyes turned skywards" (Leonardo da Vinci).



The event brought together Air Pilots, the City and the industry (All pictures by Warden Richie Piper.)

over the next six years. Under this strategy all new

developments would have to incorporate climate measures, and the 2040 Net Zero target also encompassed the City's investment portfolios.

He said: "We want to help the whole world get to Net Zero in less



The Lord Mayor, William Russell

than half the time of the industrial revolution," noting that already 23 countries have raised £63 billion in green bonds through the City. The mobilisation of finance in this cause meant "...scientific innovation meets financial innovation." Two further striking catch-phrases from the Lord Mayor were: "We are talking greening finance and financing green" and "Go green or go home – and if we don't go green we won't have a home." Scientific innovation meets financial innovation

Sir Stephen Hillier, Chairman of the Civil Aviation Authority, pointed out that everybody needed to recognise that young people were intensively focussed on environment. He was acutely conscious, he said, that the sector would face major challenges going forward but that at the same time it had to focus on the greatest challenges from global crisis. Perhaps his most telling statement was the simple



CAA Chairman Sir Stephen Hillier

one: "Time is short – it can't all happen in the 2040s."

Robert Courts MP, the Aviation Minister, said in his address that: "This is a defining moment, a defining decade." Aviation was responsible for 5% of global emissions, but was getting more



Aviation Minister Robert Courts MP

than 5% of attention. It was vital to the economy and peoples' lives, and would bounce back after the pandemic - but do it in a sustainable way. The government was aiming for domestic net zero for aviation and airports by 2040, and net zero for transatlantic aviation was possible within 10 years: after its recent consultation, the full Jet Zero strategy would be published in 2022. Noting that the country needed a sustainable and highly profitable aviation sector, he emphasised the desire for what he called 'guilt-free' flying: "Flying is not the problem; emissions is," he said.



Holly Greig, Department for Transport

Holly Greig, the Deputy Director of Aviation Decarbonisation at the Department for Transport, noted that the government's sixth Carbon Budget called for a 70% reduction in carbon emissions from a 1990 base by 2035, and that it included international aviation and shipping in its remit for the first time. Putting UK aviation into context, she pointed out that in 2019 UK domestic aviation produced 1.4million tonnes of CO₂ (1.2% of the UK total), but that international aviation produced 37million tonnes, 6% of the global total.

The recent Jet Zero consultation on the rapid uptake of new technologies had produced 1,300 responses, and resulting from that there would be a Jet Zero strategy in 2022, with roadmap. That would embrace three main principles: clear goals with multiple solutions; international leadership without competitive disadvantage to the UK; and delivery in partnership. She warned that even with the highest ambitions there will still be residual emissions

in 2050 – estimated to be 21million tonnes in 2050.

ALTERNATIVE FUELS

Most of the discussion on alternative fuels centred on Sustainable Aviation Fuel (SAF) for the short term, and the potential of hydrogen for the longer



Sheriff Alison Gowman, Green Finance Institute

term. While SAF was seen by many contributors as offering significant savings in carbon emissions, Alison Gowman pointed out that current production capacity of only 100million litres/year was insignificant against aviation's current total global consumption of 445million tonnes/year by 2050. [At kerosene's density of 0.8kg/litre, total SAF production capacity is of only 800,000t, or less than 0.2% of potential global demand – Ed.] While Aviation Minister Robert Courts reminded delegates that

the UK Government was investing £180million in SAF production facilities, Colin Sach noted that the world's current annual production of vegetable oils (likely to form the majority of feedstock for SAF) amounts to only 200million tonnes.

That was not to downplay the potential of SAF: Gowman reported that just a few days before the event, Rolls-Royce had flown a Trent 1000 using 100% SAF on its Boeing 747 testbed, and had committed to making all its Trent engines capable of operating on 100% SAF (compared with the 50% currently approved) by 2023. That would mean that within two years, net zero carbon operation would be possible with about 40% of the



David Morgan, Director of Flight Operations, easyJet

world's long-haul aircraft engines.

Hydrogen was seen as providing a greater potential long-term, but there were issues with it. David Morgan, Director of Flight Operations of easyJet produced a startling statistic which put it into context: 18t of kerosene would enable an Airbus A320 to fly from London to Dubai; 18t of battery would get the

same aircraft to Dover; and 18t of hydrogen would get it all the way to Sydney, Australia – but the volume involved would be impossible to carry. As Liveryman Colin Sach, CEO of Sach Capital pointed out: "Even if hydrogen is the saviour, it will require a redesign of aircraft to carry the fuel in the mid-section with passengers above/below/alongside – the blended wing concept." Its



Colin Sach, CEO of Sach Capital

manufacture was also a cause for concern, as production either emitted huge quantities of CO₂ when using traditional methods, or consumed enormous amounts of (renewable) electricity. There was also the issue of storage, as Morgan noted: cryogenic storage involved maintaining the hydrogen at a temperature of -253°C, and the adoption of hydrogen would need the involvement of many more stakeholders, not just airlines. Colin Sach extended the point that hydrogen was not easy to store or transport by asking the question: "Which is better - a large store of pressurised hydrogen, or a mini nuclear power station at every airport?"

OPERATING EFFICIENCIES

While new and emerging technologies could and would eventually play major roles in carbon reduction, there

was widespread acceptance that operating today's technologies better could have an immediate impact. Aviation Minister Robert Courts listed some of the areas where efficiencies could be applied in the short term: airframes, airspace modernisation and ground operations. In the latter area, we could stop using fossil fuels in airport vehicles, and think: "How do people get to the airport?"

David Morgan of easyJet reminded delegates of the scale of the problem ("We have put 2,000 gigatonnes of carbon into the atmosphere since the start of the industrial revolution...") but that also: "We will have to continue using kerosene for some time to come, so we must be



Marion Geoffroy, MD Wizz Air UK

more efficient, and burn less carbon per customer."

As Marion Geoffroy, Managing Director of Wizz Air UK said: "If all European airlines ran aircraft as modern as Wizz does (average age 5.08 years) and used Wizz operating procedures, they would save 34% on their emissions."

Airlines needed to upgrade their fleets fast, she said: the more efficient they were, the less SAF or other fuels would be needed.

A whole series of more efficient operating procedures was proposed by the WCSIM's Martin Hawley: continuous descent approaches (CDA) and continuous climb departures could each save approaching 1% on fuel burns, while single-engine taxiing could save over 2%. Even bigger savings could come from unimpeded taxiing (he estimated that around two minutes of every average 11-minute taxi was wasted, while using electric tugs could save a total of 15min of engine running per departure) and fuel savings could be further enhanced by having more stands at terminals, to reduce delays. Together, he said, savings like these could amount to a 10% reduction in fuel burn: to put that into context, 1% of fuel use across Europe was the equivalent of two million tonnes of CO₂ emissions per year. To easyJet's David Morgan, a 10% saving was "...a no-brainer – let's take the quick win."

Earlier, CAA Chairman Sir Stephen Hillier had emphasised the importance of airspace modernisation, which could offer a rapid opportunity to reduce carbon – but was far more difficult to achieve than it might appear." One of the difficulties, according to Liam McKay, Director of Corporate Affairs at London City Airport, was noise: "Noise is a massive 'but' issue in airspace management." Changes in airspace management had to take into account the impact on noise, and make sure that it applied to all

airports and routes equally.

Paul Heathcote, Chair of the Industry Advisory Group on Sustainable Aviation at Nottingham University, also made the point that a significant part of airspace management was optimising runway capacity and making runways resilient to fog



Capt Paul Heathcote and YAP Chair Will Wright

and reducing other outages – and that better aircraft aerodynamics were also needed, to allow reduced separation. Martin Hawley raised the issue of airspace usage – for example the handover of military airspace that civil aviation then doesn't take advantage of.

Looking further into the future, Professor Jonathan Morrison of Imperial College introduced the results of research which had demonstrated potential drag reductions through the excitation of small-amplitude, high-frequency vibrations in aircraft skins. Such research was at an early stage, and he acknowledged that, as yet, there was no practical application or knowledge of any effects that such technology might have on, for instance, cabin noise.

During the panel discussions, Phil Seymour, President of aviation data provider IBA, asked searching questions about other aspects of efficiency, for instance: "How much CO₂ is used in building an aircraft?" Paired with that in this context was the question of what really was the economic life of an aircraft, and whether converting old airliners to cargo aircraft was justified. He also asked about the efficiencies of maintenance, and whether ferrying aircraft halfway round the world to benefit from cheaper maintenance costs could be justified.



Philip Seymour, President, IBA

FINANCE

Sheriff Alison Gowman said: "Decarbonising aviation will require significant investments in scaling up the production of SAF, renewing the aircraft fleet, developing new technologies, and upgrading the infrastructure." To fund these investments, the aviation sector would need to attract new capital providers, willing to balance short-term return risks with the long-term benefits of environmental, social and governance (ESG) financing. She echoed the suggestion from Shell and Deloitte in a recent report that aviation needed an equivalent of the Poseidon Principles – an initiative developed for the shipping sector by banks and other industry stakeholders to provide a global framework for responsible ship finance.

Such a framework would measure the carbon intensity of loans, she said, so that lending decisions could involve considerations of the climate. Financiers could then balance a project's high sustainability score against its greater economic risk. Those principles would also enable the establishment of a common baseline to assess and disclose whether a financial institution's lending portfolio was in line with adopted climate goals.

A possible alternative suggested by Gowman was a major international effort in the style of Airbus supported by maybe four or 5 countries to fund a new air propulsion system. Whether this could be achieved by merging several currently independent businesses or starting afresh would be the subject of much hopeful discussion. With the drivers of COP26 and public opinion, she said, now was the time for a revolution in finance for aviation to build such a coalition. The skill, time, and money to get it right needed to be allocated, so that benefits accrue to all and to a renewed aviation sector that would meet future needs.

The Lord Mayor stated that, in his view, there was shortage of capital to tackle the issues, but there were different timescales in different countries. He quoted the former Governor of the Bank of England, Mark Carney, as saying that decarbonising represented "...the greatest investment opportunity ever."

The Aerospace Technology Institute (ATI) is a virtual centre of academics and industry experts, established in 2013 to drive the UK's intellectual leadership in aerodynamics, propulsion, aerostructures and advanced systems. Gary Elliott, CEO of ATI, reported that it had so far invested £1.6billion in future technology projects ranging from Rolls-Royce's Ultrafan next-generation engine to the Airbus A320NEO wing, with that investment being matched



Gary Elliott, CEO Aerospace Technology Institute

by industry. There was a need for around £600million a year to match continuing government investment. He noted that other European countries were investing similar sums - France was spending €1.5billion, Germany €600million - which implied significant competition, but also pointed to opportunities for co-operation.

Colin Sach, welcoming the commitments from the Lord Mayor, the Minister, the CAA Chairman and Sheriff that they wished to see the City of London in the lead of Jet Zero aviation finance, noted that the huge re-engineering of finance required would be "...a herculean task, requiring a vision towards aviation finance that we have not seen for many years."

It would require working in partnership with the Government, as the City had done on many occasions in the last 500 years, be it extending trade, developing agriculture, industry or realising mineral wealth. He went on to warn that success had seldom, if ever, been achieved in isolation.

Aviation was always a partnership, involving manufacturers, airports, airlines, multiple governments, and others, and those partnerships were linked together by highly detailed international agreements, regulations, and legislation stemming from the 1920s. No other heavy asset business has the same complex global connectivity operated by national companies.

The airline industry had had a dreadful pandemic, he said. Global airline results had moved from profits of about \$150billion for the years 2015 to 2019 to losses in 2020/2021 and 2022 expected to be about \$160billion. Debt for airlines had exploded, with governments alone having lent over \$200billion. That meant that airlines were not in a good place financially: aircraft had impaired values and many balance sheets were a mess. Jet Zero could only be a dream to many very concerned about paying next month's fuel bill.

Apart from Jet Zero, there were three issues which summarised aviation finance today. Firstly, nearly 50% of new aircraft were controlled by operating lease companies. These lessors were better placed than most airlines to access financial markets, and while inflation had been low, low interest rates had assisted their successful growth. Secondly, he said: "For the last decade governments have been printing money which has created a mountain of money looking for a home. The supply of money is good and aircraft lessors are attractive as they can absorb large sums." Thirdly, that supply of money had encouraged the capital markets, particularly in the USA, to seek out aircraft lessors to fund.



The afternoon panel answers questions

On the day of the green aviation event the largest unsecured bond issued by an operating lessor had been launched - \$21 billion, partly to fund the GECAS acquisition by AerCap - and in total there were about \$135billion of aviation-related bonds outstanding. Capital markets probably accounted for 30% of total aviation debt today. Sach was left pondering three questions: Would the flow of money continue? Would growth in demand continue? Was continual growth compatible with Jet Zero? Beyond these, what could the UK government do to help reach Jet Zero? One answer was for it to take less from

the industry: "After all," he said, "the UK government takes more than most governments from the airline industry. Air Passenger Duty collects about £4 billion per annum. If this were lifted it would probably match the extra cost of requiring SAF to be used in every aircraft leaving the UK."

The government could also be asked to give the industry more, for example to provide incentives to move to the latest generation of aircraft. An approach similar to the Japanese aviation financial model would stimulate using the UK as a market for finance and to replace less efficient aircraft. That needed corporate structures that at least put the UK on a level platform to operate from, and did not effectively charge corporate tax on the equity injected when a UK company buys an aircraft to lease overseas. "If there is a serious intent to make the City a great place to own and finance aircraft, it must encourage structures that work," he said.

He went on to say: "This is undoubtedly one reason Dublin became attractive as a base for operating lessors. They could operate without the negative tax consequence in the UK. Do not forget that the first



Robert Seaman chairs the panel

major aircraft operating lessor, while headed by an Irishman, was financed by a London-based medium-sized merchant bank, and the majority of the directors were based in London." Now

Ireland had several thousand well-paid jobs involved in the wider aviation finance business, probably, he suggested, at London's expense.

Sach's closing suggestion was, however, that none of the of those proposed solutions would be sufficient to guarantee a transition to Jet Zero by 2050. For that, a visionary solution was required, and he suggested that that would be a new aircraft design that achieved Jet Zero due to its propulsion unit design. He invoked the example of Roger Beteille, the aviation visionary behind the founding of Airbus, and the outcome of his vision. France now exported about 50% more aircraft and components than the UK, could produce an entire aircraft which the UK probably could not, and had a larger number of high skilled/ high wage employees in the aviation sector than the UK. "If the Government and City do not seize the opportunity and create a multi-national grouping to achieve such a goal," he said, "another will". Properly constructed as multi-state organisation combining the engineering strengths, funding from the City jointly with maybe the governments of the UK, India, Australia and others to reflect world aviation growth it could be

achieved. "This," said Sach, "could truly achieve Jet Zero by 2050."

TAX AND INCENTIVES

Throughout the day, and especially during the panel discussions, much attention was paid to possible incentives which could be offered to airlines to hasten decarbonisation – and to passengers to encourage them to choose the most sustainable travel options. Both Marion Geoffroy and Holly Greig highlighted the importance of providing environmental information to travellers at the point of booking: Geoffroy was in favour of making that information offer mandatory.

The question of whether airlines with the best environmental performance should be rewarded with incentives like more airport slots was also raised. EasyJet's David Morgan was in favour of rewards, but pointed to difficulties with slot incentives, especially where privately-run airports were concerned. London City Airport's Director of Corporate Affairs Liam McKay thought there could be a future for offering extra "green" slots for low-carbon, low-noise operations at the beginning and end of the day. Geoffroy was in favour of rewards for sustainable operations, but not necessarily with slots – airport taxes and charges could also be used, she suggested. McKay also pointed out that none of this was straightforward – lower-carbon operations could lead to higher noise, for instance.

The question was also asked as to whether the developed countries should help the less-developed to move to next-generation, more efficient aircraft, which seemed to have general support amongst panellists, although Colin Sach made the point that the new technology in aircraft was already available to any airline that could afford a lease...

There was much attention during the panel discussions on the potentials of taxation and the tensions between



Event co-chairman Robert Seaman wraps up

carbon taxation and CORSIA, the Carbon Offsetting and Reduction Scheme for International Aviation developed by the International Civil Aviation Organization (ICAO). The Lord Mayor had pointed

out in his opening remarks that there were 64 different carbon prices around the world, and that global standards and prices were needed. Colin Sach highlighted the difficulty in reaching that goal: "How do you do a carbon tax to a common standard with different local conditions and priorities?" he asked. Gary Elliott noted that to achieve a global emissions trading scheme, buy-in was needed from the major players – the USA and China.

A FLIGHT PATH TO SUSTAINABLE AVIATION



By Marion Geoffroy, Managing Director, Wizz Air UK

There is no doubt that the pathway to Net Zero will require rapid transformation of the aviation industry. As we begin to recover from the turbulent Covid-19 pandemic, it has provided a unique opportunity to build back better and design for a low-carbon future, giving airlines the opportunity to take stock, and to consider their fuel-efficiency programmes.

In October, I spoke at the 'Air Pilots Green Aviation Event – Jet Zero 2050' in London, where I discussed what the industry needs to do to achieve the ambitious climate change targets. From fleet modernisation and smart airside operations to new energy pathways and technologies – there is definitely no silver bullet solution – but what became clear to me is that with collective industry action we can make Net Zero in aviation a reality.

Firstly, we must consider what airlines can achieve with the current technologies available, such as operating the best and latest-technology aircraft, as well as what a truly sustainable, net-zero transport solution will look like in the future and the steps required to get there. At Wizz Air, sustainability is an important element of our business model, and has been since the company's foundation in 2004, and this mindset informs our day-to-day operations and the planned sustainable growth of the company.

As we emerge from the pandemic, the need for connectedness and affordable travel opportunities has never been more important, and our view is that sustainability should not be compromised in order for our customers to reconnect with loved ones, travel on long-awaited holidays or fly for business. After all, aviation is not the enemy, carbon is. In the last year alone, we opened 18 bases and 300 routes across Europe, and in the next 10 years, we are committed to more than tripling the size of our young and sustainable Airbus aircraft fleet, supporting over 20,000 jobs.

But here lies the challenge: we are all facing the urgent need to take action on climate change, whilst also growing global connectivity and enabling every part of society access to affordable air travel. Achieving these ambitious climate goals will require significant technological breakthroughs, in order to make way for new energy pathways to power future aircraft.

It is great to see that the ATl Fly Zero programme is demonstrating that there is a tangible future for zero-emission aircraft driven by hydrogen and that Airbus, for

instance, sees hydrogen as the pathway towards its goal of bringing a zero-emissions commercial airliner to market in the next decade. We are keenly looking to invest in hydrogen-powered planes and are pleased to participate in the Fly Zero programme, providing our input into the 2050 scenario planning.

We also know that sustainable aviation fuels (SAFs) will be key to helping the industry reach Net Zero carbon, but with SAF accounting for less than 1% of today's flights, there is a significant challenge in encouraging its uptake. The infrastructure to develop these technologies does not yet exist and until it becomes more readily available, accessible, and affordable, it is important to focus on adapting the current technology to reduce emissions.

In order to succeed, we must operate as sustainably as



Wizz Air's young fleet includes the highly-efficient Airbus A321XLR

possible using technologies and techniques available today.

Without a doubt, a major part of current emissions reduction is to ensure that airlines operate in the most fuel-efficient way, with newer aircraft and technology. When it comes to our fleet, Wizz Air operates one of the youngest aircraft fleets in the world and we only purchase the best and latest aircraft technology. Interestingly, it is worth noting that if every airline in Europe flew the same modern fleet as Wizz Air and operated them in the way that Wizz Air operates them, CO₂ emissions in the industry would reduce by 34%.

When discussing these important topics with industry leaders at the Air Pilots event, it was clear that in order to make Net Zero a reality, a united and collaborative approach between governments, industry experts, the financial sector, researchers, manufacturers, energy suppliers and tech players is required. We know that the next generation of travellers wants to make sustainable choices, and it is our joint responsibility to work together with key stakeholders to reach the ultimate goal of net zero by 2050.

ATI FLYZERO: DESTINATION ZERO

By Nathan Harrison, Communications Manager, ATI

When the global pandemic first hit last year, the Aerospace Technology Institute (ATI) was justifiably concerned that R&D for aviation would be the last thing on anybody's mind - a luxury that nobody could afford, according to its CEO Gary Elliott. The ATI is a not-for-profit organisation created by the UK civil aerospace industry and government in 2014 to create a technology strategy for UK aerospace and build a portfolio of R&D activity.

After an initial pause however, interest in R&D picked right up again with demand for ATI support even surpassing previous levels, Elliott says. Why is this? Largely because of the move towards sustainable technology topping the research agenda. Now really is the moment to build back better, or greener in the case of aviation.

"Decarbonisation is too big to be dealt with on a business-as-usual basis," Elliott explains. "So, we decided to shape the UK response more actively than we might in more normal circumstances, launching the FlyZero project."



ATI has come up with numerous potential aircraft concepts (ATI)

FlyZero sets out not simply to reduce carbon emissions but to realise zero-carbon emission commercial flight by

2030. The project is funded by £15million from the UK government to February 2022, by which time the team of around 100 experts will have delivered three zero-carbon emission concept aircraft designs together with detailed reports on key areas including the manufacturing demands, industrial roadmaps and delivered assessments of their sustainability and economic credentials.

Made up of engineers, aircraft designers, systems specialists, pilots, airspace experts and others from across the UK aerospace sector including Airbus, Rolls-Royce, GKN Aerospace, Spirit AeroSystems, GE Aviation and easyJet to name a few, the FlyZero team represents a cross section of aviation capability in the UK.

Leading the team is industry veteran Chris Gear, who was previously chief technology officer for GKN Aerospace. "The ambition of the FlyZero challenge was just too tempting for me not to come out of retirement," Gear says. "And having assembled a world-class team of experts who have the ability to shape the future of aviation, the project remains a very exciting prospect."

The scope of the project from propulsion to policy and supply chain to operations means FlyZero is also bringing in expertise from specialist organisations across the UK through subcontracting opportunities and working with UK universities to commission specialist research and development in areas such as contrail avoidance, hydrogen combustion and sustainable cabin design.

"Zero-carbon emissions is non-negotiable for FlyZero, but we also want to push the boundaries of what's possible in terms of reducing other emissions such as NOx and noise while also creating the most sustainable aircraft possible from a manufacturing, materials and end-of-life perspective," says Naresh Kumar, head of sustainability on the project. "The UK has a rich history of aerospace innovation and world leading research universities and we're aiming to bring these together to develop the zero-carbon emission aircraft technologies of the future."

The team has been assessing primary fuel source options including fuel cells, ammonia and hydrogen. It recently released its first output paper, Primary Energy Source Comparison and Selection*, which identified liquid hydrogen as having the most potential for powering the next generation of zero-carbon emission aircraft.

"The key frontrunner is liquid hydrogen," Gear says. "This brings with it lots of other complications in terms of aircraft configuration and airport infrastructure which the team is now working hard to address."

Advanced technologies to deliver zero-carbon flight within a generation require long-term support and funding for the ATI recently confirmed to at least 2031.

"We have a clear strategy for delivering the technologies with the potential to spearhead a new generation of aircraft here in the UK," he says. "These findings are ripe for continued development which will ultimately be the difference between concept aircraft and realising zero-carbon emission commercial aviation. It's a matter of time before these technologies are putting people in the sky, and my bags will be packed ready to board the first flight."

*https://www.ati.org.uk/wp-content/uploads/2021/10/fz_0_6.1-primary-energy-source-comparison-and-selection-final-230921-2/



ATI CEO Gary Elliott – Decarbonisation is too big to be dealt with on a business-as-usual basis (Richie Piper)

THE SIR FREDERICK TYMMS MEMORIAL LECTURE 2021

Dr Sophy Antrobus MBE: How Are Remotely Piloted Air Systems (RPAS) affecting the way the Royal Air Force fights and thinks?



Dr Antrobus looks at the future for drones (Richie Piper)

The 2021 Tymms Lecture was delivered at the RAF Club on 21st September by Dr Sophy Antrobus, who is a Post-Doctoral Research Associate with the Freeman Air & Space Institute at King's College London and Council Member of the Royal Aeronautical Society,

and served 20 years in the Royal Air Force.

Dr Antrobus began by looking at how RPAS had first come into service in the intelligence and reconnaissance roles but had quickly assumed a wider significance by the beginning of this century when the CIA first asked for them to be armed. Although they were remotely piloted, the RPAS of those early days had to be controlled from close to the battlefield: "At the time the curvature of the earth made satellite relays from a distance difficult, but now we have the capacity to fly them from the other side of the world," she said.

The advantages of remote piloting were obvious: while an RPAS had to be launched and landed close to its target, mission control was remote and flexible. Where "normal" crews couldn't stay on station long-term because of fatigue, with RPAS they could hand over to a relief crew which might not even be in the same place: with the RAF's Reaper "An operator in Crete can hand over to one in Lincolnshire." Equally, the aircraft itself needed no support systems for a crew, and enemy action couldn't kill the crew – "Crash without casualty", as Dr Antrobus put it.

There were, however, some disadvantages - Gregoire Chamayou in *The Theory of the Drone* (Penguin, 2015, translated by Janet Lloyd) said: "Partisans of the drone promise a war without losses or defeats – what they fail to mention is that it will also be a war without victory". Also, RPAS lacked peripheral vision and situational awareness, and were not resilient.

The ability of RPAS to linger over potential targets for long periods ("persistence") was having an effect on both the operators and those in the firing line. "Controllers get to know a lot about their targets, as they can watch them at close quarters for weeks," she said, but that also meant that they were much closer to their targets' fates than were the pilots of conventional aircraft. She highlighted

one telling quote from a US controller, watching on an infra-red camera after an RPAS had launched a Hellfire missile: "...It took him a long time to die. I just watched him. I watched him become the same color [sic] as the ground he was lying on..."

The effects on potential targets, and those around them, were just as striking: "A whole village of 1,900 people in Yemen evacuates every time they see or hear a drone," she said, saying that because of this "persistent surveillance" targets have moved into towns, and now use public transport to move around, to avoid detection.

Perhaps the most interesting of Dr Antrobus' observations were about psychological and legal factors surrounding RPAS operations. Controllers could feel that they were not valued by the more traditional disciplines in the RAF (even people at the Reaper base at Waddington had described them as "...video games guys") and also that they were more under surveillance than others. "In an aircraft people aren't watching you, but with RPAS everybody can see the feed," she said, noting that the "courage" or otherwise of controllers had taken on a different hue with RPAS. In conventional warfare courage could be seen as dying for your country, but also killing for your country, but with RPAS courage might be seen as deciding not to kill.

This was leading to different approaches to recruitment and training of RPAS controllers: they would now be recruited from Day One for this task, rather than being down-selected later as was the case in traditional RAF careers. "The nature of the person and the stream they



The Master introduces the 2021 Tymms Lecture (Richie Piper)

join will be changed, especially by AI (artificial intelligence)", she predicted.

Her final points – and the subject of questioning from the audience – were about the legal niceties of remote

warfare and the position of RPAS controllers. In answer to the question on would there have to be a different legal framework for prosecuting war crimes arising from RPAS operations, Dr Antrobus replied: "There are lawyers on call for the crews – a whole structure that can be consulted. They are the most protected of combat people." Dr Antrobus was thanked for her lecture by Master-Elect Robin Keegan.

AN ENCOUNTER WITH A SUBMARINE

by PM Dr Ian Perry



We are privileged as a Company to have Affiliated Organisations, Squadrons, Military Units and Royal Navy Boats.

Past Master Christopher Hodgkinson had been a Royal Navy helicopter pilot, and I had been an Army pilot.

Back in 1997 I thought therefore it would be a very good birthday present for him, if I could organise a trip on one of Her Majesty's ships or boats. I thought 'what about a submarine, as they can fly'. That would be the one to go for, as it is not a boat for your everyday trip round the bay. It can do far more, and our subs can pack a rather hefty unbelievable punch or two if required.



HMS Tireless gave PMs Perry and Hodgkinson the experience of "flying" underwater (All pictures Crown Copyright: Ministry of Defence)

'FLYING' BOATS

Submarines 'fly' under water. They have a planesman and a helmsman, who have a push-pull left-hand-up-a-bit and right-hand-down-a-bit control columns. They have propellers and pitch controls. I have simplified it a little, but the machine flies in the water. The water is however slightly

thicker than air. The principle is basically the same as an aeroplane, only this machine can stop without stalling, but does have to be balanced, with water ballast being moved about as it goes up and down, a bit like pumping fuel around your wings on Concorde. There are some very good websites explaining how these sea goliaths move. So how do you go about getting a visit to, and/or a ride on, a nuclear submarine? The simple answer is that you write to the correct Ministry Department stating what it is you want to do, why you want to do it, and being able to prove that your security status is without question. You also have to wave all the positive flags in your locker. Being Master at the time helped somewhat. You also have to wave all the flags in your accompanying colleague's locker, and any from anyone else's locker. You need a bit of help from any nautical friends who can also put in a good word, preferably an Admiral or three. When your case is being considered you have to be prepared to travel, jump through as many hoops as are put before you, and never,

ever give up. The results can be spectacular.

So, it came to pass, after some months, that we were finally accepted for a visit, and, to even go for a ride in one of HM submarines. No dates were given, as the submarine we were to visit was very much on active service, and frequently went AWOL. This happened to us, as the dates were moved about. She came back from a 90-day patrol and went off almost immediately for another three weeks. We were told that the boat we were to visit was called HMS *Tireless*.

TIRELESS

HMS *Tireless* was the third Trafalgar class nuclear hunter-killer submarine, and the second submarine to bear this name. She was launched in March 1984 and decommissioned in June 2014, having had some interesting history including an underwater accident.

She was 276ft or 85m long and weighed 5,000t, with a crew of 130. The weight of course varied with the displacement. She had a Rolls-Royce nuclear reactor and speed of over 30kt (classified) submerged. (Our latest and biggest submarines are the *Dreadnought* Class which are 500ft (150m) long and displace about 17,500t. They have a complement of 135 sailors and carry 8-16 Trident ballistic missiles.)

HMS *Tireless* was going to be moored in Plymouth Sound, where we were to board her. She could not come in further, as there were objectors to nuclear powered ships coming into port, but more important was the fact she had a sonar array deployed from the back of the boat. Our joining instructions stated that we were to muster (please note the use of the proper nautical term) the night before at the Officers' Mess (Wardroom) at HM Naval Base Devonport, for a briefing and dinner. Others on the trip included members of the Parliamentary Armed Forces Scheme (PAFS), and two lady members from the Admirals' Office at the MOD. The Admiral wanted all his land-based staff to have the experience of going to sea in one of the



Round hull makes boarding difficult

boats they administratively/operationally looked after. He said it made people more aware and gave them a better

understanding about the ships and those who serve in them. We all support that practice.

Our party totalled eight in all, plus our Escorting Officer, who had served on HMS *Conqueror* in the Falklands when it sank the *Belgrano*. The Captain of *Tireless* had been the Senior Exec Officer on that same trip.

I sat at dinner, next to the then Lady Member for Rosyth, who was the Labour member on the PAFS. They are



It's smoother down below

selected to serve for a year and visit all branches of the Armed Forces, reporting back to their Minister or Shadow. It gives them 12-14 days experience, where they had none before. We were told that they do not always turn up. We had some

missing. What a wasted chance of a lifetime.

BOARDING

We were woken at 05:00, had whatever breakfast we fancied - some were dubious about going to sea on a full stomach, following the previous evening's intake.

We were taken by a bus to a quay in the dockyard.

There we met what is known as a Navy Tender, which we proceeded to board or tumble onto, whichever way you might describe it. We had been told to dress appropriately to be able to board a ship at sea. Wear sensible footwear etc. We then set off through the dockyard, out into Plymouth Sound, which is a large stretch of water, cut partly off from the sea by a rocky bar with a lighthouse on it. It is actually a breakwater and moored just inside was our submarine.

Now, getting on board a round-hulled submarine is very difficult. Around what most people call the Conning Tower was a forest of ropes and rope ladders. We all had to climb up and around, assisted by some very strong-armed matelots. Our rope journey took us to the main forward hatch, from where we were assisted down into the submarine. The sea was not exactly that calm, but it would have been quite hazardous if it had been really rough. Once inside you were met by a dimly lit passageway, lined with tubes and wire looms. More sailors directed us to the wardroom, where we were introduced to the Captain and the main members of his crew. He briefed us.

We were to leave the Sound, turn half-right into the open sea, proceed for two miles north, then turn basically due west and submerge to a depth of 250ft, and head out under the Western Approaches. I had previously spent some very wet, cold and windy hours in these waters some years before, with seven other people, in a large dinghy on what was called a survival exercise. This was

very different. After our tour of the boat, lunch would be served here in the wardroom. The MPs were to go off and meet the boat's company; the ladies had their own tour, as did Chris and I. After lunch there would be time for a discussion, followed by a simulated torpedo attack on an as-yet unidentified target. It might be HMS *Sheffield* which was known to operating in the area.

We had No. 3 as our guide, and the three of us set off forward. There were the torpedo tubes all ready to go, plus a large number of vegetable sacks. When they designed the submarine, you might think that they forgot that the crew might have to eat for 90 days: space was definitely at a premium. If you are going to fire one of the world's most lethal torpedoes, why not add a few potatoes or cauliflowers with it.

We then went into the radio room, which we were told, was to have the analogue equipment replaced by more compact digital units at the next ten-year refit/refuel. When asked what would then occupy the space we were told "more electronic toys". Considering that the analogue message system, when the aerial is just poked out above the surface, and the messages can be held bouncing around the ionosphere for ages, can upload and download hundreds of messages a minute with the old system, just think what a digital system will do.



There's a choice of periscopes

"DIVE, DIVE, DIVE"

We then went back to the control room just in time for me to say:

"Dive, Dive, Dive," and this incredible machine gently slid under the waves down to periscope depth where the vision is amazing, 12 miles to the horizon. Then on down to 250ft, then further, as the wake turbulence from the propulsion unit at 250ft can be seen by satellites.

Our tour of the rest of the boat was equally amazing. The galley had a pair of large upright walk-in freezers. The meals go in according to the grand plan, with the 90th day menu the first to be loaded, and so on until fully loaded, with little or not much room to spare. When on a long patrol you have to eat what you are given. There is some choice, but it takes planning.

The engine room was rather like the inside of a small power station, all dials and switches. It is of course a small power station, capable of running for ten years without refuelling.

The sleeping area was also of interest, as the system used is "Hot Bunking". There are two complementary crews aboard; one on duty, one asleep. At turnaround time your

bunk, as you go on duty, is taken over by another crew member who has just finished duty.

The two ladies from the Admirals Office were not happy with this system, as they said they would also not be happy unless they had their own dedicated sleeping and washing facilities.

We went back to the control room, and the Navigating Officer explained, from the charts on his navigation table, that during lunch we had turned 180 degrees and we were now heading eastwards looking for a target. The sonar was beginning to ping a shorter note and the ship was brought up to periscope depth. Modern sonar can identify ships by their sounds. Every sound is unique to that ship.

We took it in turns to have a look. There is the main periscope with an astonishing field of vision, and a smaller attack periscope with limited vision that makes hardly any surface wash when raised above the water.

There we could see, at a distance of about ten miles, HMS *Sheffield*, a Type 22 Frigate, named after the Type 42 destroyer, that was sunk during the Falkland's War.

BATTLE STATIONS

Then suddenly the Captain announced to the entire boat: "Battle Stations". Crew appeared in full breathing equipment and were running to position themselves all around. Everyone had a place to go. "We were going to sink the *Sheffield*". I am not sure who said it but a remark was heard from somewhere: "not again". There is a wonderful sense of humour amongst these submariners, that you have to be part of, to fully understand. The crew then went through the full drill of loading and readying one of its forward tubes with an acoustic ballistic ship-breaking torpedo. The track was laid, read out, checked, distance, time to area impact, etc.

When all was ready, the Captain said: "Fire One". The whole boat gave a pressurised lurch, as this torpedo is launched using the internal hull pressure to fire it down the tube. I was sitting next to a sailor who was operating a small red joystick and I could see the torpedo symbolically shown on his screen tracking towards the *Sheffield*. A voice in my ear said: "You have control". The sailor moved out of his seat and I got into it. There was some feel in the control as I guided the weapon towards the target.

The Voice, who was of course the Captain, yelled out: "Change target, change track, redirect onto new target, heading 230°." This order was repeated by another who I could not see, and yet another sailor called "The Scribe" was writing everything down in Chinagraph on a perspex roll. I could now see what was wanted and moved the small control stick onto the new heading and could see a

new smaller target. "Target now a French fishing trawler called the *Froggy Sprat*." There were about two minutes left to run to the boat. Everything went eerily quiet, as though this was for real, and I was controlling the situation. Remember the submarine is moving on a heading away from the target, with the Captain watching every few minutes on the battle periscope.

Next to the small red joystick I was using with my right hand, was a red domed mushroom-shaped button. "Hit it when you reach the target and shout 'Impact'". When the torpedo reached the target, I hit the red button and called out "Impact". Up went the periscope: "Target destroyed, resume normal duties, ship now steer 275 and increase speed to 25kt". "Well done" he said. I got up and was given some applause. "I thought I would make it more interesting by switching targets". I said it was a relief as I did not want to feel responsible for sinking the more-recent *Sheffield*. During the turn, Chris achieved a long-held ambition of being able to call 'Up Periscope' before scanning the assembled ships.

BACK ON DECK

We were now some 20 miles from Plymouth and surfaced at 10 miles, when Chris and I were invited up onto the conning tower bridge. All submarines on the surface must have responsible officers on the upper bridge until the boat docks or, in our case, moors up. We had an amazing view from up there.

Everything you may have read or seen films about submarines, cannot compare with what we had just seen, or where we had been. It was a profound, exciting experience, on a boat with more punch than a battleship. I did not mention the surface-to-air missiles or other armaments.

As we arrived at the mooring, there was the cutter to help us. Out came all the ropes and netting. When it was all secure, we bade our farewells, and asked for permission to leave the ship. Permission was granted, and we made our way, with the help of the crew along the ropes and netting, to get into the cutter.

Trips on Aircraft Carriers are one thing but having lunch somewhere under the Western Straits and then going to "Battle Stations" in one of Her Majesty's submarines is something else.



Tireless in the Arctic reflections on a unique experience

PROFILE: 50 YEARS OF AVIATION

By Liveryman Greg "Rufus" Rulfs



A little over 50 years ago at the age of 17 and having just completed my last year of high school, I joined the Royal Australian Navy to commence my pilot training. I had cut out a small recruitment advertisement from the local paper and posted it off to the Brisbane Recruiting Office. This led to

completing the pilot recruitment process through which I successfully jumped, much to my surprise and disbelief.

I had never been in an aircraft and only seen them from a distance, either in the air or from an airfield boundary fence. But for as long as I could remember, I desperately wanted to fly these absolutely amazing machines.



Where it all started, the CAC Winjeel (All pictures via author)

Several weeks later, after completing Naval Indoctrination and lots of ground school at Royal Australian Air Force Base, Point Cook (Navy pilots were trained to wings standard by the RAAF), I found myself sitting in a CAC Winjeel for GF I. I could not believe I was actually sitting in an aircraft for the first time. My first instructor, Al Blyth, an original General Dynamics F-111 Pilot, allowed me to savour that moment for about 30sec before he dragged me back to reality.

Fifty years later, I am sitting in a Boeing 777 Simulator, training and checking B777 pilots in Cathay Pacific. It has been an amazing journey during which I never worked a day, rather I have been paid to pursue my passion for and love of flying. I spent 10 years as a Naval Aviator operating off the Carrier HMAS Melbourne, seven years in the RAAF after the fixed-wing element of the Fleet Air Arm was disbanded and 34 years in Cathay Pacific.

My aviation career has touched on many elements of our industry: carrier Operations; ASW; strike and fighter Ops; QFI Duties in both the RAN and RAAF; experimental test flying after graduating from ETPS; and 34 years in Cathay

Pacific flying Lockheed L-1011 and Boeing 747 and 777 airliners. During my time in Cathay Pacific, I have spent over 28 years in the Check and Training Department and been involved in every element of airline training up to Base Training Captain. When you are tasked to upgrade an STC to a BTC, I guess you can say you have covered it all.

I still maintain a Class I Medical thanks to that absolutely wonderful DAME, Dr Cocks who wrote a superb article in Issue 46 of Air Pilot: thanks, Robert for being such a holistic and well-balanced DAME and not a box ticker. I maintain an Airworthiness Test Pilot Certificate which allows me to fly post 65 years of age.

I also fly a Yak-52TW, which I half-own, in Gympie, Australia. Hopping in the Yak always reminds me of GF I in the Winjeel - and sometimes I feel just as useless as I did on GF I. I find that I have to draw on areas of my airmanship model that have not been used for a long time; areas such as propellers, self-refuelling, tail-wheel ops, radial engine handling including starting them on a cold morning when they are exceptionally grumpy and, most noticeably, doing everything yourself and being responsible for every element of the operation. The highlights of my career in chronological order are:

- Receiving my Wings;
- Qualifying day and night as a carrier pilot;
- Graduating from QFI Course at CFS;
- Graduating from the Empire Test Pilots School;
- Becoming a Commander in Cathay Pacific after 3½ years as a First Officer;
- Joining the Check and Training Department of Cathay Pacific.

I have had the pleasure of flying many different aircraft types (approximately 20) during my aviation career. Landing the Grumman Tracker on HMAS Melbourne at night was certainly one way to get an instant adrenalin kick. I instructed on the CAC Macchi MB-326H both in



Landing the Grumman Tracker on HMAS Melbourne

the RAN and RAAF. I went through ETPS in 1981 and had the pleasure of flying a full range of RAF aircraft including the Hawker Hunter, BAe Hawk, SEPECAT Jaguar, English Electric Lightning and Canberra, and Hawker-Siddeley Andover. I completed my preview on the McDonnell-Douglas Phantom at RAF Coningsby. Flight testing weapons systems on the Dassault Mirage and F-111 was an extremely satisfying element of my 50 years. I also conducted evaluations on the Embraer Tucano and Pilatus PC-9 prototypes for the RAAF.

In Cathay Pacific, I completed my command on the L-1011 after only 3½ years as a First Officer and was a Training Captain two years later. My timing in joining Cathay was perfect. Having flown the 747&-400, I have completed nearly 26 years of service on the 777. As an Authorised Airworthiness Pilot I have had the pleasure of accepting many 777s from Boeing on behalf of Cathay Pacific – and, sadly, I have also returned quite a few to their final resting places.

All of this flying has resulted in approximately 25,000h



ETPS, Boscombe Down, 1981

and I have enjoyed every hour. When asked: "What is your favourite aircraft?" I simply state: "All of them".

I have had two significant events during my 50 years of aviation. Firstly, a controlled crash/ditching in a Grumman Tracker 400m in front of the carrier following a night 'bolter' that went wrong and, secondly, a multiple bird-strike that destroyed the engine of my Mirage on rotate.

The RAN, RAAF, RAF and Cathay Pacific have allowed me to pursue my childhood dream, and I will always be thankful for the aviation opportunities and roles that the Services and Cathay Pacific have bestowed upon me.

By far the most powerful dimension of my 50 years in aviation has been the calibre of my fellow aviators. I have been embedded in absolute professionalism and total commitment to the profession. Whether it be my mentors and instructors, or my peers on squadrons and within Cathay Pacific, or the students I have trained, I have never been disappointed with the level of professionalism. Every day I get to mix with highly-motivated, positive and confident men and women who are aiming for the highest

standard possible; this despite events such as COVID, SARS, economic downturns and 9/11. I have seen the odd bad egg in the industry and fortunately they are few and far between. A lack of professionalism in our industry usually results in failure or death.

Aviation has come a long way in the last 50 years, with the arrival of digital technology, smart munitions, fly-by-wire, active control technology, vectored thrust, GPS, FMCs, enhanced GPWS and TCAS, windshear warning systems, sophisticated autopilot systems and electronic engine control - the list goes on. However, despite all the advances in technology, the fundamentals of being a pilot remain constant. A pilot must build and maintain an airmanship model that is based on the solid foundations of absolute professionalism and self-regulation, smooth, accurate stick and rudder skills, terrain awareness, traffic awareness and situational awareness. We need captains who embrace their role and lead and manage seamlessly, first officers who think like captains, open and honest CRM environments on the flight deck, checkers and trainers who are passionate about developing the next generation of aviators and pilots who are positive and confident and believe in themselves and believe in aviation.

What we don't need in aviation is over regulation and over-compliance mechanisms. We don't need any more over-educated pilots and aviation physiologists. We don't need to fix things that aren't broken. We don't need to complicate simple issues. We don't need to write SOPs that drag pilots down to the lowest common denominator; rather let's raise the lowest common denominator in our aviation fields. We don't need to stifle common sense. We need to use the word AIRMANSHIP with pride and understand the depth of its meaning.

Finally, you don't need much more than the three-times table to be a good pilot, but a small boy or small girl standing at a boundary fence staring at aircraft on a tarmac or gazing at aircraft overflying is usually a good sign of a potential pilot.

First civil command – the Lockheed L-1011 TriStar



INTO THE OVERSHOOT

A round-up of less-formal items which have caught the Editor's eye

(British Airways)

SYNCHRONISED RETURN

British Airways' and Virgin Atlantic's first flights to the US since the lifting of more than 600 days of restrictions for the majority of UK travellers departed for New York JFK at 08:30 on 8th November in a symbolic synchronised take-off. The one-off British Airways Airbus A350 service also had the honour of being allocated flight number BA001, a designation previously reserved for Concorde.

The BA flight was using 35% sustainable aviation fuel – provided by BP and made from used cooking oil. BA claims this is the first commercial transatlantic flight to be operated with this high percentage blend of SAF.



(Lufthansa Technik)

VIRTUAL UNREALITY

Imagine your widebody VIP aircraft interior displaying not just the finest fabrics, furnishings and finishes but also a whole virtual world, projected onto the cabin walls. Lufthansa Technik, working with display manufacturer Diehl Aerospace, has unveiled its *Explorer* concept, which could also incorporate features such as a viewing platform/veranda deployed from the optional freight door on your Airbus ACJ330 for your ground-viewing pleasure, and an underfloor, in-flight-accessible garage (or "mobility lounge", viewable from the main deck via a glass floor) for that special car you just have to have with you everywhere you go. Mind you, if you can use the technology to dial up a immersive experience of anywhere on Earth or under the sea, you might ask yourself why you need an ACJ330 in the first place...



LORD MAYOR'S SHOW

The traditional Lord Mayor's Show took place on 18th November and this year the Master was joined on the three-mile parade through the Square Mile by Assistant Elizabeth Walkinshaw and Warden Richie Piper. The procession is a wonderful example of traditional British pageantry and takes place on the day after the new Lord Mayor of the City is sworn in. Beginning at the Guildhall it processes via Mansion House and St Paul's Cathedral to the Royal Courts of Justice on the edge of the City of Westminster, where the new Lord Mayor swears allegiance to the Crown.



(Phil Whalley)