

JUNE 2021 ISSUE 45



AIR PILOT



INSIDE

**HRH THE DUKE OF EDINBURGH
1921-2021** A Portrait of our Patron

RED ARROWS IN 2021 & BEYOND

Exclusive Interview with Red One

OXFORD v CAMBRIDGE AIR RACE



**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.

JUNE 2021

26th Air Pilot Flying Club Fly-in Duxford
30th T&A Committee Air Pilot House (APH)

JULY 2021

7th ACEC APH
11th Air Pilot Flying Club Fly-in Henstridge
13th APBF APH
13th Summer Supper Girdlers' Hall
15th GP&F APH
15th Court Cutlers' Hall
21st APT/AST APH
22nd Livery Dinner Carpenters' Hall
25th Air Pilot Flying Club Fly-in Weybourne

AUGUST 2021

3rd Air Pilot Flying Club Fly-in Lee on the Solent
10th Air Pilot Flying Club Fly-in Popham
15th Air Pilot Flying Club Summer BBQ White Waltham

SEPTEMBER 2021

15th APPL APH
15th Air Pilot Flying Club Fly-in Oaksey Park
16th GP&F APH
16th Court Cutlers' Hall
21st Luncheon Club RAF Club
21st Tymms Lecture RAF Club
30th Air Pilot Flying Club Fly-in Compton Abbas

Applications for Visits and Events

Please kindly note that we are ceasing publication of 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, or follow us on Twitter @AirPlotsCo



A MESSAGE FROM YOUR EDITOR...



Britain's airports and airfields have long been under threat in one way or another, from environmentalists, neighbours, developers and others, but now in 2021 the threat looks greater than ever. In the next five or six years RAF stations including Scampton, Henlow, Halton, Alconbury and Colerne are due to close – all of

them with currently usable and useful runways and facilities, and all slated for some mix of domestic or industrial development.

Coventry airport, with an active and thriving General Aviation community, is threatened with disappearing under the development of an electric-battery 'Gigafactory' and airfields like Fair Oaks are the subject of housing proposals. Permission to re-open Manston has recently been revoked on the grounds that a proper case had not been made for it in the planning process.

The British Government's legislative programme foresees reforms to the planning system in the name of worthy aims such as accelerated house-building and industrial regeneration. These will remove layers of local oversight and seem to incorporate no safeguards against the loss of infrastructure such as airfields, which are vital to the future of aviation.

The irony is that the Government is ploughing research and development money into the development of electric aircraft and the batteries and systems to power them. Yet, at the same time, is seemingly complicit in frustrating the use of those very aircraft through failing to protect our existing airfields – far less encouraging the building of new ones - through the planning system.

Much of the public opposition to airfields is based on historical perceptions or recollections of them as being noisy and polluting. We cannot pretend that the airfields of the future and the aircraft which will use them will be entirely silent and pollution free. Electric propellers will still make some noise, just not at fine-pitch Harvard levels; even the slipperiest of carbon-fibre airframes will generate aerodynamic noise; and access roads will still generate traffic. However, all of these intrusions will be much lower than their equivalents of today, to say nothing of those of even 30 years ago – and, of course, would be a fraction of those resulting from the building and operation of new factories.

It is equally true that airfields do not necessarily have to occupy as much land as they did traditionally: the aerodromes of 100 years ago were circular, because aircraft could only land or take off safely into wind, whereas their modern equivalents are much more tolerant. So there is a case for aviation and other industry to co-exist: an airport which no longer hosts mainstream airline traffic could yield some of its substantial acreage to industry while still preserving a safe environment for general aviation operations. The choice should not be a binary one between aviation and new industry or housing development, but of mutually tolerant and beneficial co-existence.

Allan Winn - Editor

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Cover photos: The Royal Air Force Aerobatic Team over the Greek coast during their annual Exercise Springhawk.
Inset - HRH The Duke of Edinburgh (Both Crown Copyright)

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 2 MB;
- More than 2 images to be sent via a Dropbox file, rather than an e-mail attachment.

HIS ROYAL HIGHNESS THE DUKE OF EDINBURGH

Compiled by Assistant Steve Bridgewater

It was with deep regret that the Honourable Company of Air Pilots received the sad news of the passing of HRH The Duke of Edinburgh.

Prince Philip had a long and personal involvement with the Honourable Company of Air Pilots and its forerunner the Guild of Air Pilots and Air Navigators (GAPAN). His Royal Highness had been our Patron since 2002, when he succeeded HM The Queen in the role. Prior to that he had served as the Company's Grand Master from 1953 and became our first Liveryman when, as Grand Master, he accepted the Company's Letters Patent from the Lord Mayor of London in 1956.

On that occasion he stated: "In granting this Livery to the Guild, the City, for all its ancient institutions, has shown, once again, that it is well aware of modern development, and I think it also recognises that the air is a new importance to this great centre of commercial enterprise. For its part the Guild will always attempt to show that everybody engaged in the air transport industry, will constantly try to perform its duties efficiently, and to be active and helpful partners to the business interests of the City and for the welfare of the nation as a whole".

ACCOMPLISHED AVIATOR

By now you will all doubtless have read a plethora of obituaries citing the Duke's excellent work and personal attributes. This is not the place to repeat them; rather, we would like to pay tribute to His Royal Highness as a pilot, as an advocate for aviation and as a proponent of this Company.

Prince Philip was a keen and able aviator. He gained his RAF 'wings' in 1953, his helicopter wings in 1956 and his private pilot's licence in 1959; achieving a total of 5,986 hours in 59 types of aircraft. His final flight was on 11th August 1997 from Carlisle to Islay. Writing in *The Times* shortly after the Duke's passing, author Gyles Brandreth recalled asking the Prince whether his life had been enjoyable. "My life? Enjoyable?" he replied. "I enjoyed flying. I enjoyed flying very much. I sometimes think I should have joined the Royal Air Force instead of the Navy".



The Duke of Edinburgh climbs aboard 'his' Harvard during flight training. The five stars painted below the canopy signified his rank of Marshal of the Royal Air Force. (Crown Copyright)

His Royal Highness prepares to fly a VW Beetle-engined Rollason Turbulent in 1959. It is the only single-seater ever flown by a member of the Royal Family and is currently approaching the end of an eight-year rebuild at Derby airfield where students completing the Duke of Edinburgh's Award have helped in the restoration.



His flying training had begun at White Waltham in November 1952 and after soloing the Chipmunk he progressed to Harvards and Vampires, being awarded his 'wings' by the Chief of the Air Staff, Air Chief Marshal Sir William Dickson at a private ceremony at Buckingham Palace.

PERSONAL RECOLLECTIONS

Through his ardent support of the Company and his wider love of aviation, a number of our members were fortunate enough to meet the Duke. Past Master Colin Cox was privileged to be granted the Livery by the (then) Grand Master at a special meeting of the Court in February 1993 and recalls his affable demeanour. This – and his remarkable memory – are common themes among those who remember meeting His Royal Highness.

Concorde pilot and Past Master Mike Bannister fondly recalls meeting Prince Philip during the Livery Dinner when he was Master in 1990. "Over the first course he asked me about my career and I explained that I was privileged to be a Concorde pilot," says Mike. "He replied by saying *"When the wind is in the east that b****y thing comes over Windsor and wakes us all up!"* Years later, in 2016, I was introduced to him again as I was then a Duke of Edinburgh's Gold Award Presenter. In the Throne Room at St James's Palace he remembered me and with a wry smile said: *"You're the reason that I'm now deaf!"*

Warden Richie Piper has happy memories of talking to "a fellow Harvard pilot" when the Duke last attended our Trophies and Awards Banquet in 2016. Richie was not alone in being engaged in flying conversation by the Prince and although Past Master Cliff Spink met the Duke on a number of occasions, he has one particularly fond memory of meeting our Patron at the Palace in June 2013 to discuss the Royal Charter and progression from GAPAN to the Honourable Company.

"The matter of our name became the subject of some debate," remembers Cliff. "At that time, it was my privilege to the Master of our company and given the importance of any decision that would set in stone our name into the future, I decided to seek the counsel of our Patron. So it was that at 4 o'clock on 13th March 2013 I was ushered into an anteroom and a minute or so later the Duke walked in. Although I came quickly to the reason for my audience, it was clear from the outset that His Royal Highness wanted to talk about one of his favourite subjects - aeroplanes."

"We quickly became enmeshed in talking about his flying training and how much he enjoyed flying the Harvard, an

aircraft that I had been flying only that week. His passion for aviation shone through and, despite my gentle efforts to bring us back to the reason for my visit to Buckingham Palace, we kept talking about a range of aircraft both historic and modern. I was flattered that he wanted to talk about the types I had flown both in the RAF and since, and his knowledge was extensive. His own aviation stories were both fascinating and amusing and I could have spent hours listening to the charming and modest way he recounted the tales. But time was pressing and with not much of my half an hour left I managed to get back to the matter of our potential names for our Company."

"He then recounted the members of the Royal Family who, since the First World War, had been pilots, and said that accordingly he felt 'Honourable Company' was entirely appropriate. I said that I was most grateful for his direction but quite understood that together with going for Royal Charter this would require Her Majesty's assent. He smiled and said that I should not worry as he had a certain amount of influence in that direction! It was just the sort of wonderful line that I will carry with me of our Grand Master and Patron."

Warden Richie Piper and wife Gill discuss Harvard flying with the Patron during the 2015 Trophies & Awards banquet. (Gerald Sharp)



FROM GUILD TO HONOURABLE COMPANY

The honour of hosting His Royal Highness at the ceremonial banquet to mark the transition from GAPAN to the Honourable Company of Air Pilots fell to PM Tudor Owen. "The Patron was on top form throughout the evening," recalls Owen. "At the start of the passing of the Loving Cup, I was clearly trying to stifle a laugh. Those sitting nearby knew why and just as I lifted the cup, the Duke asked me: "Are you really going to drink it?"

"Later, he presented us with the framed Royal Charter and

a ceremonial Mameluke sword in a magnificent scabbard. Our illuminated Charter was not completed in time for the banquet so the framed document was actually the letter from Buckingham Palace informing us that Her Majesty had graciously granted us a Royal Charter. To much amusement, the Patron looked at it and loudly asked me: "Is this it?" He was, of course, having fun - and he continued to do so. Holding up the magnificent ceremonial sword for all to see, he said: "I would have thought the last thing a pilot needs is a sword!" and then proceeded to ask me where I was going to put it! It was obvious how much the Duke of Edinburgh was enjoying the evening – he clearly felt that he was amongst friends."

Past Master Ian Perry had only just become Master in March 1996 when he was tasked with organising a dinner for our Patron's 75th birthday in the June. At short notice the only venue available in the City was the Armourers and Brasiers Hall, but this only accommodated 75 people. "This was a coincidence which did not pass the Patron's eagle eye," recalls Ian. "I think he thought we had done it deliberately. Only I know the truth of that."

Ian found the largest challenge was whittling down the 950 applicants for a seat at the banquet to just 75. "Soon I had got an idea of (and been told) who should/could/might be there," he continues. "I had only just become Master, and I was about to upset a lot of people who were not going to be there. I later told the Duke of my dilemma as we enjoyed dinner and he thought it was very amusing. He looked around at the assembled guests, some of whom he knew, and said that I had managed to assemble most of the rogues and vagabonds he had met over the years! "How had I managed to draw them all out of the hat?" he asked. I explained that it was pure magic, the names just flew up into my hand... and some then mysteriously dropped back into the hat, until another flew up. By this method, in the end, 50 people were selected. It took a long time, but was I think the only way."

"Our Patron looked at me with an unforgettable smile, and then told me I had a remarkable gift, only he was not quite sure in what area the gift was; it could be storytelling or cunning, but probably a mixture of both."

A STEADYING HAND

Many who met the Duke outside Company life have referred to his candour and sage advice. Among those who met him in a professional capacity was Past Master Michael Fopp, whose association with the RAF Museum over thirty

years meant that he saw Prince Philip regularly. "I used to see him for a formal audience once a year and in between we used to correspond or meet as the need arose," explains Michael. "He had been Patron of the museum since it had opened in 1972, so his corporate memory was phenomenal and he had also been a Trustee of the National Maritime Museum since 1947, so his knowledge of the national museum sector was a great help to me." "Whenever I had a major project about to be launched I would go and see him and he would advise me on various aspects: including sending me away to re-write the whole proposal on one occasion because he could not understand what I was trying to do! On my return with the new explanation he supported it 100% and a new building at Hendon was the result. As everyone knows he did not suffer fools, but there was usually a twinkle in his eye followed by a sharp/humorous comment. There was no room for shrinking violets in his company."

PM Fopp also got to meet His Royal Highness when he was Master. "I went to meet the Grand Master, Prince Andrew," he recalls, "but I was delighted that Prince Philip joined us too. We reminisced about some of the aviation stories we had both enjoyed and later in the day I was honoured to receive the Geoffrey Quill Medal from the Air League. As I went up to be presented with it by Prince Philip, his first words to me were, 'Oh, not you again! Twice in one day is enough for both of us!'. He was a great man."

The Editor also met the Duke outside Company business and fondly recalls an afternoon in the sunshine at the Royal International Air Tattoo. "I was Editor of *Flight* at the time and was grabbed by a panicked PR chap from a major US company who asked me to help host His Royal Highness at their tent because his American colleagues were terrified of doing or saying something wrong. The Duke saw the funny side of it, and he and I spent a very happy hour watching and talking about aeroplanes, pausing occasionally to say hello as another nervous exec was wheeled in. Just as others have noted, he remembered things like that when we would meet later at Air League receptions."

CARING AND CONSIDERATE

PM John Hutchinson is perhaps best known for his involvement with Concorde but during the 1999 Trophies and Awards Dinner, conversation with the Grand Master turned to an earlier period in the Master's career: "His Royal Highness was seated to my right with my wife Sue seated to his right," remembers John. "During the course of

the evening Sue was chatting to him and somehow they started talking about a major air disaster I was involved in." (Ed: the skilful landing of Boeing 707 G-ARWE after an engine caught fire and fell off shortly after take-off in April 1968: the incident perhaps best remembered for the bravery of flight attendant Jane Harrison who was awarded a posthumous George Cross – the only GC ever presented to a woman in peacetime).

"The Duke was amazed and it turned out that he remembered it well; he had been sitting in his office at Windsor Castle that day and noticed the flames coming out of the left wing. He got his binoculars and nervously tracked the aeroplane until it disappeared out of sight as it came in to land. He turned to me and asked me to tell him all about it from my perspective as a junior First Officer sitting at the nav station of this Boeing 707. We never stopped talking for the rest of the dinner!"

It is perhaps this care and compassion that led the Duke to be such a great supporter of the Company's annual awards scheme which honours the many admirable endeavours and individuals in aviation. In order to recognise the selfless work and saving of thousands of lives by helicopter rescue teams worldwide, he instigated the Prince Philip Helicopter

Rescue Award more than 40 years ago.

Although he was associated to many groups and charities, His Royal Highness retained a particularly close connection and affinity with this Company and the Guild that went before it. Many years ago he summed up the relationship when he said: "I have quite a collection of decorative titles, but this is no problem where I have no particular knowledge of the subject involved. In the case of the Guild of Air Pilots and Air Navigators, it is rather different as I am actively involved in aviation with fixed as well as rotating wings. The problem here is to keep a balance between absenteeism and interference."

The Duke was always successful at treading that fine line and we will miss his steadying hand on the controls. We will leave the final word to PM Spink, who pointed out that: "We as a Livery Company have been blessed over many decades with the involvement and counsel we have received from Prince Philip, first as our Grand Master and then Patron. I am sure he will be remembered with admiration and affection by all in the Honourable Company of Air Pilots both now and into the future."

God speed Sir, may you forever have blue skies and favourable tailwinds. □

The Patron and PM Tudor Owen trying - and failing - to keep a straight face during the Royal Charter Banquet in 2014. (Gerald Sharp)



"Holding up the magnificent ceremonial sword for all to see, he said 'I would have thought the last thing a pilot needs is a sword!' and then proceeded to ask me where I was going to put it!" (Gerald Sharp)



GAZETTE

APPROVED BY THE COURT

13th MAY 2021

ADMISSIONS

As Upper Freeman

Stephen James BOXALL
Matthew Leslie FULLWOOD (HK)
Samuel Jonathan GERVAIS
Lok LEE (HK)
Kimberly Dawn LYSAK (NA)
Oscar Karl Francis NICHOLS (HK)
Matthew Peter TRAVERS (HK)
Christopher VEAZEY-DOUCET

As Freeman

Steven James BOND
Ronald Ho Kwong MAK (NA)
Scott SANGER

As Associate

Finlay Alexander BUNT (AUS)
Gregory CHAMBERLAIN
Alexander William DAVIES
Bridget DONALDSON
Oi Yee LAU (HK)
Charles Robert SKEET

ACKNOWLEDGED BY THE COURT

13th MAY 2021

REINSTATEMENT

Kirsty Jane SMITH (HK)

REGRADE

To Livery

Dheeraj BHASIN
Andrew Lyle ROBERTS

To Upper Freeman

Dominic EARNSHAW
Samuel WORTHINGTON-LEESE

DECEASED

HRH THE PRINCE PHILIP (PATRON)
John BOWDEN
Alan BRIDGE-BUTLER
Philip DULHUNTY (AUS)
John KEMP
Donal LEAVY
David LEWRY

RESIGNATIONS

Troy ALDER (AUS)
James CHAMPNESS (AUS)
Ray CONLEY (AUS)
Scott CREW (AUS)
Peter DAHL (AUS)
Gavin DAVIES (AUS)
Walter DOLLMAN (AUS)
Eden HANSEN (AUS)

MASTER'S MESSAGE

Sqn Ldr Nick Goodwyn



This edition of the Air Pilot is marked by the passing of our Patron His Royal Highness, The Prince Philip, Duke of Edinburgh.

As Master, I wrote to extend the sincerest and heartfelt condolences of all the Court and our members to Her Majesty The Queen and to our Grand

Master on the passing of Prince Philip. I noted that we were humbled that the Duke had maintained a close connection and affinity with the Air Pilots over so many years and that we had greatly benefited from his interest, council and wisdom on all matters pertaining to our Company and aviation in general. He was a great supporter of our annual awards scheme which honour the many admirable endeavours and individuals in aviation. We always enjoyed his presence and his humour when attending our events and dinners over the years.

We mark the passing of our Patron, having ceded his role as Grand Master to His Royal Highness, The Prince Andrew, Duke of York in March 2002, with great sadness but with deep respect for a true Air Pilot. The IPM and I were able to offer those condolences in person to our Grand Master as we were afforded an audience with him in Royal Lodge, Windsor in late April. We were warmly received by His Royal Highness and enjoyed a wide-ranging discussion with him on aviation matters and presented a comprehensive update on Company activities over the last year.

I offered the observation that his Father, on becoming our Grand Master in 1953 would have been aged just 32 and as such a 'Young' air pilot, influencing and guiding the then Guild and as such, I hope, an inspiration for today's Young Air Pilots within the Company.

LECTURE PROGRAMME

Despite the continuing - although easing - pandemic restrictions, it has been a busy time since my installation as Master and I especially thank IPM John Towell, the GP&F, the Learned Clerk and Secretariat for their help and guidance so far. I am continually surprised, and in awe, of the level of activity of so many of you in support of the Company.

Among the highlights has been a captivating Zoom lecture given by Past Masters Mike Bannister, John Hutchinson, Jock Lowe and Peter Benn discussing their experiences and reflections on flying and operating Concorde. It occurred



Attendees at an online lecture were thrilled to hear no fewer than four former Concorde pilots discussing the iconic supersonic airliner. (BAE Systems)

to me how very fortunate we are to have four PMs, all with such a rich and insightful background, willing to give their time to enrich us all. What a privilege to sit back and enjoy it.

This year's Sir Alan Cobham Lecture [see p29] was given by Matheu Parr and Phil O'Dell from Rolls-Royce and discussed electric propulsion and the quest for the electric-powered air speed record. The overwhelming and positive messages and feedback received both during the talk and in subsequent communications to the Air Pilots was testament to the interest, enthusiasm and energy they engendered in describing this fascinating project.

ZERO EMISSIONS

The Cobham lecture reflected that pioneering spirit so very reminiscent of the support that Rolls-Royce provided for the Schneider Trophy competitions in the 1920s and '30s, and which in turn inspired the wartime Merlin and Griffon engines. The manufacturer's latest work will enable aviation to work towards ambitious zero emission flight and environmental targets.

I thank the DAA for organising the Cobham Lecture and also for his work with the environmental group of the ITF, led by Liveryman Robert Seaman. The group is in the preliminary stages of planning an inter-Livery Green Aviation Showcase event in the City in late October ahead of the UN Climate Change Conference of the Parties (COP26) in Glasgow. This is an exciting opportunity to present the case for developing technologies that successfully promote 'green' aviation as the future. We should be keen to advocate for - and where possible influence and support - those emergent technologies which will steer the flightpath and help overcome those challenges. We will ensure that you are kept aware of our plans to hold a Green Aviation Showcase event.

SCHOLARSHIPS

I was recently welcomed as a council member to a meeting of the Air League. The IPM, Clerk and I have met subsequently with Freeman John Steel, the Air League Chairman, and look forward to further mutually beneficial collaboration.

Additionally, Lenka and I have attended a number of other virtual City Livery and consort's events.

Closer to home, under the skilful and dedicated guidance of Liveryman Tricia Nemes, and her team of sifters and interviewers (now numbering 37 in total and supported by Angie in the office) have completed the marathon job of processing over 650 PPL, 70 FI and 80 other scholarship applications.

For this year's PPL scholarships each applicant was asked to provide a one minute film cameo of themselves which has proved to be an interesting and valuable addition to the process. The team finally interviewed 24 candidates over Zoom and selected the final eight for scholarships. This is a monumental effort, and I cannot thank all of those who take part enough for what you do for the Air Pilots in delivering an intrinsic activity which is at the heart of what the Company does.

So many of that team are also Young Air Pilots, who themselves have been active. The YAP Committee for this year has been confirmed as Will Wright (Chair and Scholarships Liaison), Ben Akhurst, Rob Mackenzie, Becky Kwo, Tom Handy and Toby Eden. They are a great team and the YAP's recent activities have included the first 'Star Gallery' presented on 18th March, which was attended by around 30 people.

This included some great anecdotal feedback on the support and advice received and tied in with the soft launch of the 'one stop shop'; a comprehensive package of careers advice, knowledge and skills training.

RAAF CENTENARY

Moving abroad, I would like to thank Captain Rob Dicker, Chairman of the Australian Region and Captain Peter Raven for representing me and the Company at the RAAF's Centenary celebrations (see p12). We were honoured that RAAF Chief of Air Force, Air Marshal (AM) Mel Hupfeld accepted a commemorative Sword to be carried by all future Chiefs and I sincerely thank Past Master Robert Pooley for his generosity and support to make this happen.

AM Hupfeld said that the RAAF had not received anything else in the way of commemorative gifts from other organisations and that this sword was the most significant commemorative item they had received. Circumstances permitting, I will meet and congratulate AM Hupfeld in person later in the year at our Trophies and Awards Banquet at Guildhall in London when I look forward to presenting a commemorative sword to honour the whole RAAF and its centenary.

Also looking ahead, I am excited that we may be able to enjoy the Summer Supper at Girdlers Hall on 13th July and then the Livery Dinner at Carpenters Hall on 22nd July; I look forward to being able to meet and welcome many of you in person again and enjoy some welcome hospitality at these and other planned events.

SIGNIFICANT ANNIVERSARIES

Before I finish, I would like to highlight a few anniversaries and significant events that have caught my eye recently.

Founded on 5th February 1941, the Air Training Corps (ATC) this year marks its 80th anniversary. Today, there are more than 900 ATC squadrons around the UK with more than 40,000 members, and we have a great connection with HQ London Wing as an affiliated unit. Many of us, I am sure, took our first steps into aviation through the ATC or CCF and I am sure many members also enjoyed their first air experience flights as a cadet or learnt to fly in the venerable 'Chippy'. The DHC-1 Chipmunk performed its maiden flight 75 years ago on 22nd May 1946 and, always rewarded with a big grin, I had the great pleasure flying and also examining in the Chipmunk when serving on CFS Exam Wing at RAF Cranwell.

An anniversary we will surely mark in the future is the first flight of the *Ingenuity* helicopter on Mars on 19th April 2021. Having hitched a ride to Mars on the *Perseverance* rover, *Ingenuity* was released once a suitable 'airfield' location had been found. The helicopter then undertook the very first powered, controlled flight in the extremely thin atmosphere of Mars - and, in fact, the first such flight in any world beyond Earth. To honour the first aeroplane to fly on Earth, the team fastened a small swatch of fabric from the original 1903 Wright Flyer to the underside of the helicopter's solar panel. On 19th April 1921, three days after what would have been Wilbur Wright's 154th birthday, that relic of humanity's first aeroplane lifted off from Mars. *Per Caelum via Nostra* indeed.

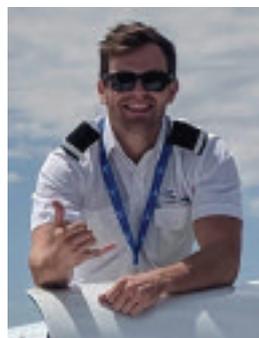
A final note is my sincere thanks to Deputy Editor Steve Bridgewater for stepping up to support Allan Winn in preparing this edition of the *Air Pilot*. □

This year marks 75 years of the DHC-1 Chipmunk and 80 years of the Air Training Corps. (Awyrr Aviation Archives)



YOUNG AIR PILOT UPDATE

By Freeman Will Wright – YAP Committee Chair



As you will be aware, this is an issue of *Air Pilot* with a focus on the life of our late patron HRH Prince Philip and his contribution to aviation.

In the week following his unique installation by zoom, the new Master met with the Young Air

Pilots (YAP) committee members to discuss our aims and objectives for both this year and what we hope to achieve together. During this meeting, he brought something to our attention that I feel is very apt.

When the Duke of Edinburgh became Grand Master in 1953, he was 32 years of age. If the YAP scheme had been in place at the time, His Royal Highness would have therefore been classified as a young member - as he was under the age of 35!

WHAT WOULD HRH HAVE THOUGHT?

This fact caused me to reflect on what Prince Philip might have seen as the important issues facing aviation and the Air Pilots during that time. For context, the Second World War had been over for less than ten years; the country was healing and building for the future. Engaging and inspiring the next generation of aviators would surely have been high on his agenda.

Thus, it is possible to draw parallels between then and now. In a post-pandemic world, we will need to ensure the strength of both the industry, and our company. Young people are, by definition, the future.

With this in mind, the committee has spent a great deal of time in recent months creating a roadmap for the future development of the young member's section. The intention is to help guide our aims and objectives; to keep us on track and heading towards a thriving community. It is accessible via the website www.airpilots.org/members/young-air-pilots/ and if you have the chance to cast an eye over it, we are always open to feedback, comments or suggestions.

A WARM WELCOME

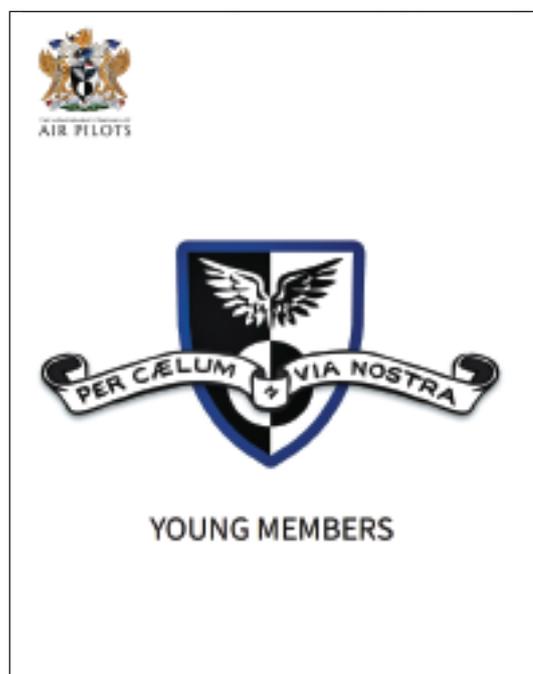
The second thing that has been keeping us busy in recent weeks is finalising a Welcome Booklet for new young members. Sometimes the world of the Air Pilots – and the Livery companies as a whole – can be confusing to newcomers. There are numerous technical committees, hierarchies, processes and procedures to become *au fait* with. Getting to grips with it all as a new member can take some time so we have attempted to remove as much of the friction here as possible.

The welcome document outlines some key areas within the Air Pilots, how it all connects and what it might mean for someone looking to get the most out of being a part of our community. Hopefully new joiners will see the benefit, but perhaps some more experienced members may find it useful too. It is also accessible on the website.

Finally, I'd like to thank Liveryman Peter Benmax for his kind donation of five of his delightful and intricate aviation-themed globes. These will be awarded to young members who encourage others to contribute to Air Pilot life and exemplify our values.

Until next time, blue skies and tailwinds. ☐

The cover of the new Young Air Pilot Welcome Booklet, which is downloadable from the website.



REGIONAL REPORTS

Hong Kong Region

Making the 'New Normal' Work

By Liveryman Valerie Stait

We often hear the phrase 'the new normal', but there has been nothing normal about flying for a long time. In fact, IATA suggests approaching every flight as 'non-normal'.

We find ourselves in uncharted and uncertain territory where things change daily, yet we still have to manage safety and risk. A key part of making this work has been the ability to adapt - one of Professor Erik Hollnagel's so-called 'pillars of resilience'.

One such area during the pandemic was airline training, as the lack of flying rapidly became an issue. Crew need to be not only legally current but also proficient. Temporary relief measures included performing some recency checks in simulators and extra sim sessions to keep skills refreshed. The flying that was available was used to keep a core team of pilots proficient. Others were kept 'operationally ready', which meant legally current and able to be brought back up to speed quickly when needed.

Annual practice of emergency procedures was problematic for crew flying out of Hong Kong as rostering a day's ground school also meant rostering 14 days of quarantine! Instead, approval was granted to send equipment around the world and its correct use observed remotely to meet regulatory requirements.



The Covid pandemic has hit the airline industry very hard, but being located in Hong Kong has presented Cathay Pacific crews with additional challenges. (Cathay Pacific)



CONTACTLESS TURNAROUNDS

Another example of adaptation was contactless turnarounds. This allowed airlines to operate to destinations that would otherwise have had onerous quarantine restrictions when crew returned. Pre-flight paperwork was moved online and cleaning, catering and access were changed. A secure chat function allowed ground and flight crew to converse, while temporary approval was obtained for an engineer to do the walk round as the crew could not step off the aircraft without ending up in quarantine on their return. Thankfully, the definitions of 'contactless' have recently been updated and the turnarounds are looking more normal, albeit with distancing and hygiene restrictions.

Local airlines adapted to make the most of vital cargo business by converting passenger aircraft to take cargo in the cabin. This was complex from the regulatory side with many restrictions and only certain categories of goods permitted. Loading also took hours longer than a dedicated freighter because of the small working space, and because of a lack of firefighting capability in a passenger cabin marshals had to patrol the freight in flight.

UNEXPECTED CHANGES

Sometimes, governments implemented restrictions while crew were airborne; resulting in unexpected procedures on arrival, or testing which had to be set up at the last minute and results obtained before the flight departed for that country.

Testing crew on arrival soon became mandatory and changed frequently. Hong Kong started with PCR testing followed by 48-hour home quarantine. Next, it was dictated that crew from most destinations isolate in a hotel until they received a negative test (which took around ten hours), but some still had to spend an uncomfortable wait for test results at the airport.

Things changed for the worse in March when it became mandatory for crew entering Hong Kong to undergo 14 days of quarantine. To keep the airline running, crew operated a block of 21-28 days (mandated isolation when

not working), followed by 14 days' hotel quarantine then two weeks off. This was a voluntary pattern and needed a whole set of mitigations and management by both individuals and company to meet the unique and challenging circumstances, particularly around wellbeing. All of this has involved endless risk assessments and applications to the authorities for temporary relief measures. Meanwhile, life on the ground continues to get ever more complicated as states implement their own sets of seemingly unfathomable regulations. Throughout this time, crews have shown a high level of

professionalism under very challenging conditions. The crews' commitment to meet these challenges both on and off the aircraft has truly done our profession proud. We talk about a 'return to normal', yet it seems unlikely we will go back to where we were. The world has evolved and so has aviation. Hopefully, we can leave the difficult and unhealthy restrictions behind and continue to develop the better ways of working and being that we have discovered. We have the opportunity to carry forwards the positive things that have been learned from this extraordinary period experienced by our generation. □

Australia Region

By Upper Freeman Captain Rob Dicker, Chairman, Australia Region

In the April edition of *Air Pilot* I foreshadowed a number of events that would be taking place around 31st March to mark the centenary of the Royal Australian Air Force (RAAF), Covid restrictions permitting.

As it transpired, there was yet another Covid breach of hotel quarantine - this time in Brisbane - leading to a lockdown in that city and disruption, once again, to many people's travel plans over the Easter period.

Fortunately, as far as the RAAF Centenary celebrations were concerned, the impact was minimal with events going ahead pretty much as planned. The weather gods were also smiling, as you could not have wished for a more perfect early autumn day in Canberra, where the main events were taking place.

CENTENARY SWORD

The day before the actual centenary I had the privilege of presenting the Chief of Air Force, Air Marshal (AM) Mel Hupfeld, with a commemorative 100th Anniversary Officer's Sword on behalf of the Master and the Honourable Company of Air Pilots. The sword is inscribed with the names of all those who have served as the service's senior officer over its first 100 years.

Had it not been for the restrictions on international travel resulting from the pandemic the presentation would undoubtedly have been made by Past Master and Managing Director of Pooley Sword Ltd, Robert Pooley, who was responsible for the design and manufacture of the sword.

As it was, the presentation took place in the office of the Chief of Air Force at the RAAF headquarters in Canberra. Also attending were Air Chief Marshal Sir Angus Houston, AM Geoff Brown, AM Ray Funnell and Captain Peter



Air Marshal Mel Hupfeld accepts the commemorative sword from Capt Rob Dicker. Captain Peter Raven looks on. (Commonwealth of Australia)



Air Marshal Hupfeld in full regalia, including commemorative sword, with his wife Louise. (Rob Dicker)

Raven, Chairman of the Trophies and Awards Committee for the Australian Region. Following the presentation AM Hupfeld hosted those present to a lunch in the Chief of Air Force Conference Room, which is decorated with portraits of the same men whose names appear on commemorative sword.

By all accounts, this gesture of the Honourable Company of Air Pilots presenting a commemorative sword was very well received by both serving and former members of the Royal Australian Air Force.





QUEEN'S COLOUR

On the Centenary, Captain Raven and I were invited to attend the presentation of the new Queen's Colour for the RAAF which took place at a parade on the lawns in front of Government House in Canberra. During the ceremony AM Hupfeld, as host officer of the parade, carried with him the commemorative 100th Anniversary Sword.

Following the presentation of the new Colour a flypast of more than 60 current and heritage RAAF aircraft took place over Lake Burley Griffin culminating in a display by the RAAF aerobatic team, the Roulettes.

More information on the RAAF's centenary can be found at www.airforce2021.airforce.gov.au and for those that missed the day, a video recording can be found on Youtube at: www.youtube.com/watch?v=N11YAD0le78. □

RAAF Centenary Flypast

The impressive flypast over Canberra on 31st March consisted of:

09.30

1 x Sikorsky MH-60R Seahawk

10.30

3 x Alenia C-27J Spartan
 3 x Lockheed Martin F-35A Lightning II
 2 x Boeing F/A-18F Super Hornet
 & 2 x Boeing EA-18G Growler

11.00

4 x Lockheed Martin C-130J Hercules

11.05

2 x Sikorsky S-70A-9 Black Hawk

11.20

1 x Lockheed Hudson, 1 x CAC Boomerang,
 1 x North American Harvard & 1 x CAC Wirraway
 2 x CAC Mustang, 1 x Supermarine Spitfire
 & 1 x Curtiss P-40 Kittyhawk

11.25

1 x Lockheed AP-3C Orion

1 x Lockheed P-2 Neptune

1 x Douglas C-47 Dakota

1 x de Havilland Canada Caribou

1 x Consolidated Catalina

1 x Bell UH-1 Iroquis

11.30

3 x Lockheed Martin F-35A Lightning II

2 x Boeing F/A-18F Super Hornet

& 2 x Boeing EA-18G Growler

4 x Boeing F/A-18 Hornet

4 x Pilatus PC-21

3 x Beechcraft King Air 350

3 x Alenia C-27J Spartan

4 x Lockheed Martin C-130J Hercules

3 x Boeing P-8A Poseidon

& 1 x Lockheed AP-3C Orion

1 x Boeing E-7A Wedgetail

3 x Boeing C-17A Globemaster III

2 x Airbus KC-30A MRTT

& 2 x Boeing F/A-18F Super Hornet

11.45

RAAF Roulettes Aerobatics Team (6 x Pilatus PC-21)



North America Region

By Liveryman Alistair Beaton, North America Region Chairman

Pitt Meadows Airport (CYPK) is one of four Regional and General Aviation training airports in the Vancouver area and is located 20 miles east of the Vancouver International Airport, on the North bank of the Fraser River. The airport was first conceived by the Department of Transport in May of 1961 and today is home to some 300 to 400 pilots. I recently met with Airport Manager, Guy Miller, who is a former Royal Canadian Air Force CF-18 Hornet pilot and Boeing 747 line pilot with Cathay Pacific in Hong Kong. Today Guy maintains his skills by flying 'right wing' in the Fraser Blues formation team in his family's 1940s vintage Ryan L-17 Navion. The Lead is Guy's father, Col George Miller, who is a 35-year RCAF veteran, flying with the Golden Hawks F-86 Sabre demonstration team before becoming team leader for RCAF Snowbirds (which is one of the Honourable Company of Air Pilots' affiliate units).

DEVELOPMENT PROJECTS

Guy is very excited at the ten major development projects that have been approved by the Airport Society since he became manager three years ago. These include the rebuilding and significant enlargement of the terminal by a private development company to accommodate not only airport management and operations staff, but also a restaurant and office space for aviation related businesses. Adjacent to the terminal building is the new NavCanada Control Tower. Pitt Meadows Airport records about 160,000 aircraft movements each year and is in the top ten busiest airports in Canada. On the west side of the new terminal is another private development in the form of an executive hangar. A new seaplane terminal and restaurant is also planned for the south side of the airport on the Fraser River.

Along with Guy, as the Chief Flying Instructor of Vancouver Aviation College, I am very excited to see the imminent completion of our College's newly constructed 14,000 ft² training facility, which is due to open in July.

In celebration of the opening of our new facility, Vancouver Aviation College is offering a significant rebate to members of the Honourable Company wanting to complete a Private or Commercial training course with us. The management team have over 55,000 hours of airline and flight instructor experience and we look forward to welcoming you through the doors. □



The new terminal building is nearing completion at Pitt Meadows Airport (All Alistair Beaton)



Construction work at Vancouver Aviation College is nearing completion.

One of the Fraser Blues L-17 Navions parked on the 900 acre ramp.



GENERAL AVIATION SAFETY BENCHMARK GROUP

By Assistant Steve Bridgewater

They say good safety is no accident and that's an ethos shared by the 25 airfields which have signed up to the newly formed General Aviation Safety Benchmark Group.

The General Aviation Safety Benchmark Group (GASBG) launched in February with the goal of improving airfield safety for GA users by making it easier to collate and share data across the UK.

The brainchild of friends Harry Harrad (Safety and Compliance Manager at London Oxford Airport and London Heliport Ltd) and Ben Spiers (Head of Safety and Compliance at London Biggin Hill Airport) the GASBG is a no-cost group open to airports and airfields which have a maximum Code C aircraft operation for passengers and a Fire Category of 6. This is to limit membership to GA operators only.

According to Co-Chair Ben, the aim of the group is to: "...give a voice to GA airfields, who are often drowned out by larger commercial airports at equivalent forums, to share best safety practices and to minimise risk."

Speaking in April, GASBG Chair Harry explained that the uptake for the group had surprised him. "Before now the safety and incident data we are recording was only accessible by the airfield where it occurred," he said. "It was our hope that by getting aerodromes to work together would improve safety but Ben and I really expected it to involve our own airfields plus four or five others. However, just two months later we've got 25 aerodromes on board as well as the CAA. We are humbled that not only does the regulator recognise the legitimacy of the group but a member of its newly formed Airfield Advisory Group also wants to be part of it."



The GASBG is best placed to focus on factors that are under direct aerodrome control such as wildlife habitat management.

(Pexels Stock Image)

NINE INDICATORS

Membership of the GASBG involves airfields uploading data on nine specific safety performance indicators (SPIs). These are:

- Damage to aircraft
- Wildlife strikes and hazard management
- Significant FOD events
- Runway and taxiway incursions and excursions
- Near misses on the apron
- Airspace and drone infringements
- Airprox
- Laser strikes
- Air Traffic engineering failures such as ILS failures

Ben and Harry have managed to secure the services of Centrik to securely host this data online in a way that makes it accessible to all, allowing the group to monitor trends as and when they develop. This enables them to see where they really need to focus their attention and allows them to work quickly to make any recommendations.

"As a provider of operational management support to aviation businesses across the globe, we are delighted to sponsor and work on this project for the GA community," said Andy Wilkinson, Head of Aerospace at Centrik. "Our existing, well established relationships with both London Oxford Airport and London Biggin Hill meant we were able to take a genuinely collective approach when developing the new General Aviation Safety Benchmark system."

The group has also secured the services of a human factors specialist, a wildlife and habitat management expert and an airport operations specialist (with 27 years of experience at Heathrow) who have all volunteered their services for free.

As touched on earlier, Ben and Harry are keen that this group focuses solely on the GA community of airfields. "The larger commercial airfields have their own safety management groups," continued Ben, "but until now nothing has existed for the GA airfields. Even when those aerodromes do have a place at the table at those meetings

they don't have the budget, influence or loud enough voices to be heard. Commercial operators can invest millions to quickly implement major changes to safety methods and technologies but the GASBG is focused on how smaller airfields can collaborate to effectively manage safety."

FIRST MEETING

The first GASBG meeting took place online and immediately saw aerodrome operators engaging in open two way dialogue, discussing problems and trends they had observed. "Skill fade was a very big topic with a lot of operators returning after the lockdown," explained Harry. "That applies to pilots returning to the skies but also to ground staff returning to work. Ops teams, fuellers, ground handling staff and ATC have all been on furlough and attendees received some great feedback from our human factors specialist."

"It was refreshing to hear airfield operators speaking so candidly about scenarios and incidents that had happened at their aerodromes," continued Harry. "They wanted to share the information to benefit the wider community, including how they'd undertaken their investigations and the root cause contributing factors that they had discovered. That, for me, is brilliant. Operators were proud of the investigations they had made and the changes that had resulted. That collaboration is what the group is about. It's about getting around the table and talking, sharing experiences and learning from each other."

The aerodromes were able to input data ahead of the first meeting and the group analysed more than 100 different safety occurrence reports dating from January to April 2021. According to Ben: "This enabled us to grade the incidents and look at areas of priority. They were classified using the ICAO Event Risk Classification Matrix which generates an event risk scoring. Based on the cumulative scores we were able – as a group – to pinpoint the areas of highest risk as well as looking at where the highest number of reports were coming from."

The result of that analysis saw Airprox incidents deemed as the highest risk area. Although there were considerably more FOD reports than Airprox occurrences, the Matrix system prioritised Airproxes as a larger cumulative risk. "As a result of the meeting it became obvious that the GASBG is best placed to focus on factors that are under direct aerodrome control," said Harry. "These include things like FOD management and wildlife habitat management for which plans can be put into place to mitigate their effect. Moving forward, the group will predominantly focus on these factors and work collaboratively to create safety strategies."



Are you clear to proceed? Runway and taxiway incursions and excursions are one of the group's safety performance indicators. (Pexels Stock Image)

Ultimately, that collaborative approach should mean that no matter which of the member airports you visit, you will see the same safety notices and posters. It is hoped that a cohesive communications plan will get the message across more effectively than the often ad hoc systems currently in place from aerodrome to aerodrome.

"Events like Airproxes, which more often than not occur due to pilot error or air traffic error, are much harder for us to influence as a group," concedes Ben. "That said, we are keen to work in conjunction with other groups and provide data from our members to help analyse incidents and help improve overall safety. Ultimately, we'd also like to include representation from the pilot and air traffic control communities within the group to offer an insight into the thought processes and human factors within both the cockpit and the control tower."

With airfields as diverse as London Biggin Hill, Blackbushe, London Oxford, St Athan and the entire Highlands and Islands group of airports already among the 25 aerodromes signed up to the GASBG (and recognition from the regulator), Ben and Harry seem to be onto a winning formula. The free exchange of information and experiences combined with standardisation of safety management system training and communications can only make the group an invaluable resource.

The GASBG plans to meet on a quarterly basis – either at a member airport or remotely. The next meeting is planned for July 2021 and any GA airport or airfield operator looking to join or to find out more about GASBG can contact the team on hharrad@londonoxfordairport.com or ben.spiers@bigginhillairport.com □

INGENUITY

By Priya Patel

Space Technical Group member Priya Patel (who has been working with NASA recently) offers an insight into the first powered flight on another planet

On 19th April 2021, NASA's *Ingenuity* helicopter made the first powered flight on another planet, more than 117 years after the Wright brothers' historic flight on this planet.

The full flight video can be found on NASA's YouTube channel.

Ingenuity flew to Mars aboard the *Perseverance* rover that landed on the red planet on 18th February. Prior to its maiden flight the helicopter was dropped onto the Martian surface by the rover, which then drove to a viewing point around 50 metres away.

The extraordinary flight took place at 12:31 am Pacific Time, however NASA's team at the Jet Propulsion Laboratory (JPL) would not receive the first data from *Ingenuity* until three hours later.

When it finally arrived the data showed that *Ingenuity* had successfully conducted the planned spin-up, take-off, hover, descent and landing. In fact, the helicopter hovered for 30 seconds at its planned altitude of 10 ft, and spent 39 seconds airborne, more than three times longer than the first



The first image from Ingenuity's camera looking down onto Martian surface on 19th April 2021. (All NASA/Jet Propulsion Laboratory)

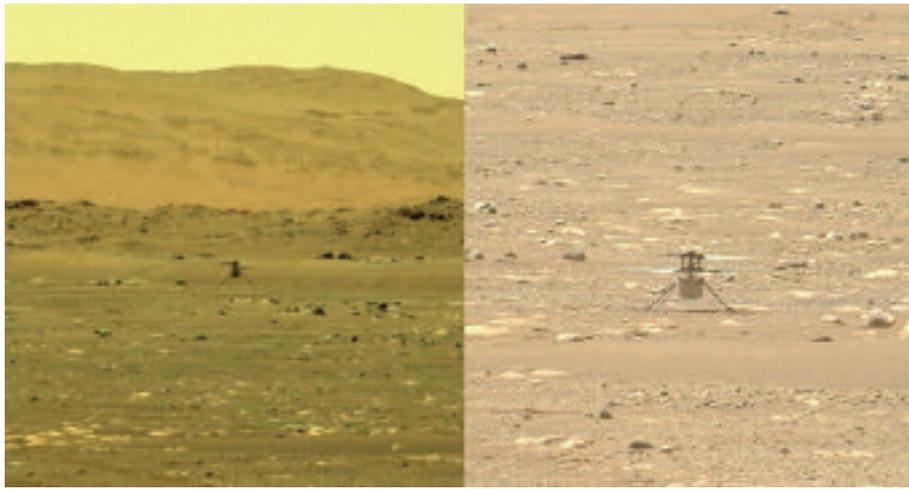
successful flight of the Wright Flyer that made similar history at Kitty Hawk in 1903.

Ingenuity even carries a piece of fabric from the wing of the original 1903 Wright Flyer and its take-off and landing area on Mars has fittingly been named Wright Brothers Field.

The atmosphere of Mars is only about 1% of the density as that of Earth at surface level, it is therefore much harder for an aircraft to generate lift, a difficulty only partially offset by Mars' lower gravity (around $\frac{1}{3}$ of Earth's). However, *Ingenuity* is designed to fly in the thin Martian atmosphere

The Ingenuity team celebrating the first successful powered flight on Mars.





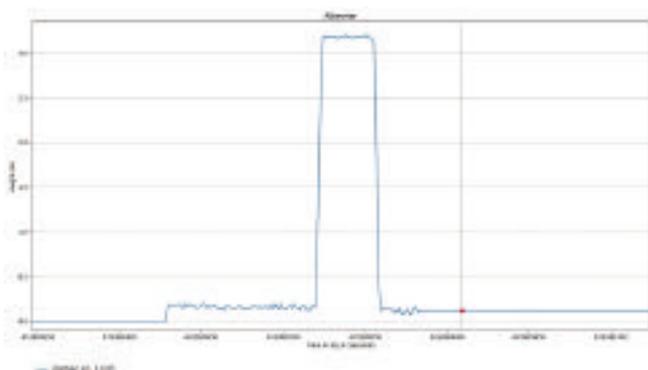
Images taken by the Perseverance rover as Ingenuity takes its first flight.

and its blades are much larger than would be needed for a similar-sized helicopter on Earth. The 1.2 m (4 ft) blades also have to rotate at 2,537rpm, compared to those of a helicopter on Earth that rotate at roughly 400-500rpm.

Ingenuity is designed to be a technology demonstrator for NASA to assess whether this technology can fly safely and will ultimately improve mapping and guidance for future space missions.

It also gives mission controllers more information on planning travel routes and hazard avoidance, as well as identifying points of scientific interest for rover operations. The payload includes a high resolution downward-looking camera for navigation, landing, and science surveying of the terrain, and a communication system to relay data to the *Perseverance* rover. It is intended to deliver overhead images with roughly ten times the resolution of orbital images and will image of features that may be obscured or unreachable for the *Perseverance* rover.

Data from the altimeter showing the height reached by Ingenuity during flight.



SPACE TECH

While it is an aircraft, it was built to spacecraft specifications as it had to endure the g-force and vibration during launch. The helicopter also includes radiation-resistant systems capable of operating in the difficult, freezing, and in the high radiation environment of Mars. The inconsistent Mars magnetic field negates the use of a compass for navigation, so it uses a solar tracker camera integrated to JPL's visual inertial navigation system. Some additional inputs include gyros, visual odometry, tilt sensors, altimeter, and hazard detectors. It is designed to use solar panels to recharge six Lithium-ion batteries that produce 35–40Wh, 130–140kJ of energy.

Ingenuity is expected to fly up to five times during its 30-day test campaign scheduled early in the rover's mission. Each flight is planned as technology demonstrators and is to fly at altitudes ranging from 3–5m, 10–16ft above the ground for up to 90sec each. It can also travel up to 50m 160ft downrange and then back to the starting area. It will use autonomous control during its short flights, which will be telerobotically planned and written by operators at JPL. *Ingenuity* will communicate directly with the *Perseverance* rover after each landing.

Such extraordinary technological feats inspire us as well as prepare us for future space missions that will eventually safely land humans on the red planet. They say a picture is worth a thousand words yet the first picture from the first ever powered flight on another planet provided much more than mere words. It showcases the additive contributions from passionate individuals throughout history that is pioneering a new era. □

SECURITY IN SPACE - CONFLICT AND COLLABORATION

Liveryman Su Ingle speaks to AVM Harvey Smyth (Director Space, MOD Space Directorate), and AVM Paul Godfrey (Commander, UK Space Command), to discover the importance of UK space operations.

Imagine a day when the GPS in your car doesn't work, you can't get a supermarket delivery and the traffic lights don't turn green. That's the reality if we lost our services in space either from natural hazards or from hostile action, and it would cost the UK £1 billion per day. From a defence perspective the effects would be far reaching, as modern fighter aircraft and the majority of precision weapons are reliant on space-based capabilities. Despite this, we have effectively sleepwalked into enormous reliance on these services..

UK SPACE COMMAND

The wake-up call came with the Blackett Review in 2018, which exposed the UK's vulnerabilities and highlighted that an analysis of the future use of space was vital. MOD Space Directorate was established in early 2020 to set strategy and policy for space operations, with a focus on collaboration and integration across all areas of the space sector both nationally and internationally. Part of its task was establishing the need for UK Space Command which was formed in April 2021 as a focal point for military space capability, training and operations. Air Vice Marshall (AVM) Godfrey explains UK Space Command's priorities: "First is space domain awareness," he emphasises. "Ultimately that is what we are trying to achieve for space, looking at what is up there and what it's doing. If someone else's satellite passes close to yours, is it

purpose nefarious, or is it just changing orbit? You can't make decisions until you understand that. Having the best understanding of everything happening in the domain makes you a leader in space even if you don't have many on-orbit capabilities there, because you have the information that people really want."

This could sound militaristic, but AVM Smyth clarifies the point: "It isn't about militarising space, it's about using it as an operational domain in its own right and also as the key integrator to all the other domains of air, land, sea, and cyber."

INTEGRATION

This integration is vital, involving collaboration and building the infrastructure for full space domain awareness to be established. A crucial contributor is RAF Fylingdales which is part of the Ballistic Missile Early Warning System and also tracks orbiting objects, including spy satellites. The data is shared with the USA, demonstrating essential collaboration.

AVM Godfrey continues: "I really believe we can work through the capabilities, whether it's military, civilian or commercial. Earth observation for studying weather or whales is the same as Intelligence, Surveillance and Reconnaissance (ISR) for the military. It's about the smart use of space to get everything that people need, working together in a domain that is safe and open for all."

The aim is to deliver world-leading technologies, so novel future possibilities are being explored. AVM Godfrey is excited by the potential and elaborates: "We're starting with a blank sheet of paper which is brilliant. The beauty of what we're putting together is the ability to think differently about current capabilities, but also look at new and totally unexpected ones."

The Prime Minister has pledged that the UK should be a Research & Development (R&D) superpower by 2030, and AVM Smyth considers that to be entirely feasible. "This is not just a game for Defence to play, this is a proper cross-Whitehall effort and actually the bulk of the R&D money will sit within the business area. However, we in Defence have not stood still and a tangible demonstration of this is what is happening at the Defence Science and Technology Laboratory. Five years ago they had four or five people working in space R&D. Today there are 60 plus and growing."



AVM Harvey Smyth (Director Space, MOD Space Directorate), and AVM Paul Godfrey (Commander, UK Space Command).

BETTER REGULATION

The number of satellites orbiting Earth is also growing. In January 2021 there were over 3,300, and SpaceX alone is looking at 12,000 by 2027. Debris is now causing congestion with 130 million pieces under 1mm and 28,000 over 10cm identified. Better regulation of space has therefore become essential, and discussions through the UN are already underway.

It's a global effort and the UK is taking a leading role, with the Foreign, Commonwealth and Development Office at the helm as AVM Smyth explains. "You can be a global leader in space by taking the lead on some of the softer options," he points out. "You don't have to have the most satellites or the biggest rockets. If you are driving the regulation and legislation and are seen to be the voice of sensibility, then that still guarantees you your place at the top table, and that is definitely an area where the UK has not taken its eye off the ball."

Having open regulation and easy-to-navigate legislation makes the UK an attractive place to set up space companies, and many already have their headquarters here. AVM Smyth continues: "There is prosperity in the manufacturing and launching of satellites, but future prosperity also lies in the apps, the software and the data management. The UK is not wrapped up in long-standing contractual arrangements, enabling it to be more agile and steal a march on others."

DEMYSTIFICATION

A major challenge faced by both organisations is the demystification of space, ensuring people understand its relevance to their lives; something that applies to ministers and senior officials as well as the general public. AVM Smyth explains: "We are talking to the Cabinet Office at the moment about having space events in Whitehall for senior officials and ministers, to raise awareness of how their departments have integral dependencies on space." Raising awareness is crucial but so is educating the future space experts. Recently the question was asked at NASA: "How do we get people on Mars?" The answer was to introduce space-specific topics into the high school curriculum, and this thinking is reflected in plans for a Space Academy.

"From a military perspective, we will be collaborating with the commercial and academic side," states AVM Godfrey, "but it may initially be a virtual academy outside Defence as we tie different learning centres together, all the way from school curriculum to post-graduate and beyond!"

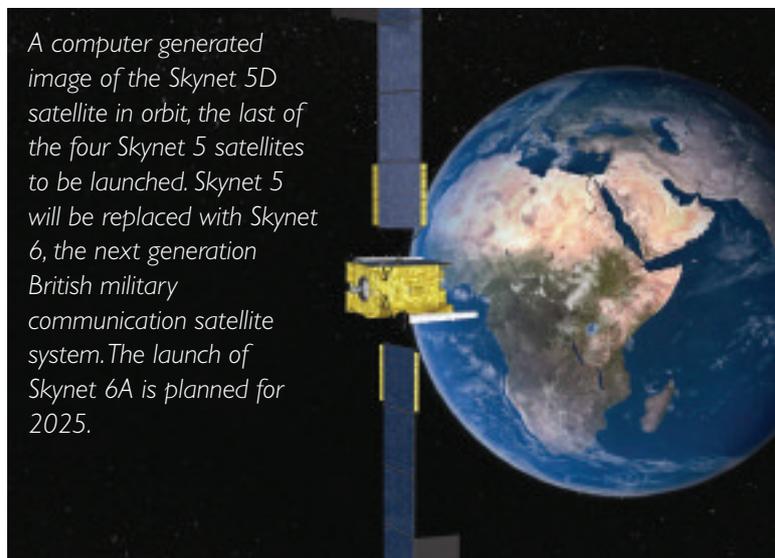


RAF Fylingdales in North Yorkshire provides a continuous ballistic missile early warning service to the UK and US Governments, ensuring a surprise missile attack cannot succeed. As a key part of the Allied Space Surveillance Network, the unit also monitors objects in space that can easily resemble incoming missiles when re-entering the atmosphere. (All Crown Copyright)

NATIONAL SPACE STRATEGY

AVM Smyth admits that in the short term the challenge will be the workforce, not the money or the programme. "It's getting the humans with the right skills in the right place to do the work that will be the pinch point," he comments.

A National Space Strategy will be published in June uniting military and civilian policy for the first time, and there are already clear visions for the future. By 2030 the next generation of Skynet, the British military communication satellite system, will be in orbit, along with a UK owned ISR constellation, providing earth observation from space as a dual-use service for both military and civil requirements. All space activities - whether military, government, or commercial - will be coordinated by a National Space Operations Centre, and an established Space Academy will train personnel. As AVM Smyth summarises: "It's a remarkable step forward from the position this time last year. When you ask what the future's about, if the answer doesn't involve space then you're probably not getting it right." □



A computer generated image of the Skynet 5D satellite in orbit, the last of the four Skynet 5 satellites to be launched. Skynet 5 will be replaced with Skynet 6, the next generation British military communication satellite system. The launch of Skynet 6A is planned for 2025.

THE ROYAL AIR FORCE MUSEUM MANAGING A PANDEMIC

By Freeman Maggie Appleton, CEO Royal Air Force Museum

In February 2020, although increasingly concerned about the impending COVID-19 impact on the UK, the Royal Air Force Museum was at a high point and looking forward to delivering a year-long programme in partnership with the RAF to mark the 80th anniversary of the Battle of Britain. Having delivered our £26million transformation to mark the RAF Centenary in 2018, the museum was celebrating its most successful two years ever recorded – in terms of visitor numbers, the breadth of our audiences and the warmth of people’s feedback. From previously welcoming around 700,000 people per annum to our two public sites at Cosford and north London, 989,000 joined us in 2018-19 and, just weeks before the pandemic closed our doors, the Museum was on track to achieve its ambitious target of 900,000 visits for 2019-20. And then came COVID-19, closing the Museum not once, not twice, but three times.

STAFF & VOLUNTEER ISOLATION

The IT team moved speedily to adopt remote working from almost a standing start and within days, our people were connecting virtually for planning meetings, all-staff webinars, tea breaks and generally looking out for each other. We were deeply concerned about our 240 staff and 500 volunteers and worked to reduce isolation by complementing online communications with buddying arrangements and telephone calls for those not so IT-savvy – though many have since developed new digital skills via

our ‘IT coaching from home’ sessions.

From the beginning, the team was resolute that we would continue striving to inspire everyone with the amazing stories of the RAF, despite lockdown. Across all areas of work, plans were moved online and new programmes created as well as the sadly inevitable – and very costly – cancellations. Always mindful of our responsibility to represent the story of today’s RAF in the national collection, we worked with colleagues to collect filmed diaries from personnel assisting with the COVID-19 pandemic emergency services and sought objects to help us reflect the global crisis in our galleries.

At no point did the team hunker down, understandable though that would have been. The importance of looking outwards, connectivity and partnerships cannot be understated. The RAF Museum’s individual plans for the 80th anniversary of VE Day in May quickly merged and blossomed into a new VE Day Virtual Festival in partnership with colleagues from the National Army Museum and the National Museum of the Royal Navy. Some 350,000 people tuned into the programme comprising online lectures; a debate hosted by presenter and author James Holland with historians from our three museums, 1940s singalongs, jitterbug dance lessons, bunting and flag-making, and recipes to experiment with and enjoy.



The author and Chief of Air Staff, ACM Sir Mike Wigston, maintain social distancing during a visit to the museum to mark the 80th anniversary of the RAF. (Jigsaw)

SUPPORTING HOME LEARNING

Meanwhile, our Access and Learning teams developed new online resources, supporting home-schooling, play and even bedtime storytelling. Then, when we were able to return to the museum during the summer, they filmed a whole new range of sessions for the autumn term; enabling us to deliver our STEM and history curricula for schools both locally, nationally and internationally.

Inevitably, the Battle of Britain 80 programme had to be largely paused or cancelled and it was tough to see all those lovingly-made plans disappear. However, our planned Battle of Britain dinner for 350 people scheduled for September 2020 transformed into a small-but-beautiful Sunset Ceremony led by the Chief of Air Staff, ACM Sir Mike Wigston, with a welcome opportunity to honour Benny Goodman, an RAF Second World War Bomber Command veteran who was determined to join us and celebrate his 100th birthday the following week. New Battle of Britain exhibitions launched at both sites the same month and we look forward to delivering some of our now '80+ 1' ambitions over the coming year.

The museum's academic lecture programme has been delivered virtually, attracting a geographically dispersed audience that would never have been possible in person. A number of our events were repurposed similarly, connecting people across the globe. The Hurricane 80K challenge was always planned to be virtual but, with lockdown, the decision was made to release it earlier than planned. With the population forced to isolate, the challenge fed into the zeitgeist and gave people the opportunity to join a collective and support our charity at the same time.

The Lancaster Challenge to run, walk or cycle 80K, 150K or 500K at the beginning of 2021 built on this with its incentive to leave the computer screen for fresh air and exercise in the dark early months of the year. Over 5,300 challengers took part, sharing stories of RAF family and friends, encouraging each other on and celebrating achievements together.

ADOPT AN ARTEFACT

In 2020, a cross-departmental team also launched the museum's Collections Online platform – always in the plan but now complemented by Adopt an Artefact; a piece of lockdown creativity which enables the public or companies to adopt and post a dedication with objects in return for varying levels of donation. It has proved a brilliant resource for presents via the website, complementing the online shop



The RAF Museum is looking forward to reopening its doors after a very difficult year.

whose uptake has increased by 79% on the previous year.

As a National Museum, the RAF Museum receives public funding to support the delivery of our purpose, but nonetheless relies heavily on self-generated income through commercial and fundraising activity to deliver important collections care and public programmes.

The RAF was superb in stepping forward to support the museum during lockdown but the £3million loss of earned income in 2020-21, a further hit this financial year and the longer term impact on our supporters' ability to invest and fund grants, has had an inevitable impact on our ability to deliver our Strategy 2030 ambitions. However, we see Strategy 2030 and transformative masterplans for Cosford and London as a contribution to our national recovery and press on with ambition and positivity, albeit laced with a hard dose of realism.

Clearly, none of this has been easy. There was much talk about everyone being in the same boat, but that has simply not been the case. We've been through the same terrible storm – that's true – but some navigated it in ocean-going liners while others were in leaky tubs. We have colleagues living alone in bedsits, others balancing work with home-schooling and many worrying about family members. Far too many of us have lost people we love.

But through all of this, the RAF Museum has learned and grown as an organisation and leapt at least five years forward in our digital development – and that is something we will be building on. One of my most positive reflections as CEO is that we have been reminded of the importance of people, of kindness, and – for us as a Museum – of the power of our real objects to learn from and be inspired by. The public demonstrated all of that when they returned to us with such appreciation last summer and, at the time of writing, all hands are on deck to welcome visitors back. We very much hope you will join us. □

RED ARROWS: PREPARING FOR 2021 (AND BEYOND)

By Assistant Steve Bridgewater

In an exclusive interview with Assistant Steve Bridgewater, Sqn Ldr Tom Bould talks about how he prepared for his first season as 'Red One' and what the future might hold for the Company's affiliated unit, the Royal Air Force Aerobatic Team

After the 2020 display season was essentially cancelled because of the pandemic the Red Arrows finds itself in a strange situation as it prepares for the year ahead.

"The lockdown hasn't really affected our training regime" explains Sqn Ldr Tom Bould, who took over as Red One in October 2020. "We have been in a 'bubble' at Scampton throughout that period so our training flights have pretty much continued as per normal albeit with Covid mitigations in place. Our output dropped a little due to constraints around the station, for example air traffic control's shift patterns were altered, so the window of opportunity for flying narrowed a little, but on the whole we were able to continue as per normal."

Sqn Ldr Bould began his RAF career as a 'creamie' instructor and was the Tucano display pilot in 2010. He later went on to fly the Typhoon operationally before being selected for the Red Arrows for the 2015-2017 seasons (flying as a member of the Synchro Pair for two of those years).

Sqn Ldr Tom Bould was born in Bradford and educated at Woodhouse Grove School. While studying for his degree in Aerospace Engineering at Manchester University, he completed his elementary flying training as a member of Manchester and Salford UAS. (MOD Crown Copyright 2021)



After his first tour with the team Tom was promoted to Squadron Leader and became a Flight Commander on IV(AC) Sqn at RAF Valley teaching on the Hawk T.2.

He now rejoins the team as its leader for the next three seasons. "Unusually, I'm the only new member of the team this year" he continues, "so I'm in the enviable position of having a very experienced group of colleagues. This means the main training requirements for the 2021 season have been mine and I have had to get used to leading such a large formation. For the others, the main learning curve has been getting used to my flying style and the cadence of my voice, which will doubtless be subtly different to my predecessor's on the radio."

The remaining eight pilots are remaining in the same positions they flew (or at least trained for) in the 2020 season. This, Tom explains, is because they have not necessarily obtained sufficient experience to progress to the more demanding roles within the formation.

However, he is treating this situation as a huge opportunity to break down the display using their expertise and advice. "They're the subject experts," he says, "and this has allowed us to produce a very complex, complicated and demanding routine for 2021."

SPRINGHAWK

The first nine-ship formations were flown just before Easter and at the time of our interview the team members had just returned from their Easter break and were preparing to head to the Hellenic Air Force base at Tanagra in Greece for their annual *Exercise Springhawk* deployment.

Exercise Springhawk, makes full use of more settled, fine weather in Greece to perfect and polish the team's display and usually sees the team fly up to 15 full shows each week – testing the pilots, engineers and support staff. It is always a key moment in the Red Arrows' calendar, bringing together all of the winter and spring in readiness for the start of the summer season. "It's more important than ever that we go on Exercise this year" continues Tom, "as the team didn't get the opportunity to do so in 2020 due to the restrictions."



As these words were written the Red Arrows were in Greece as part of Exercise Springhawk.

The team is scheduled to return to the UK in early June and the remainder of the month sees a relatively quiet start to the year's displays. The projected calendar then gets progressively busier during July, August and September: "We're really looking forward to getting back to what we do" affirms Tom.

NOTAMs

In recent years there have been a couple of high profile airspace infringements where the Red Arrows has had to abort a display when aircraft have entered the Restricted Airspace (Temporary). The team is therefore continuing to urge GA pilots to read and abide by NOTAMs that list its display appearances. "We'd also urge pilots to check for NOTAMs that detail our route between shows and operating bases," explains Tom. "We generally transit as a group of between 9 and 11 jets in loose formation and relatively high speed so it is difficult for us to manoeuvre to avoid other traffic. My plea to other pilots is therefore to avoid areas where we are likely to be flying."

The team members take it in turns to act as navigator and flight planner for these cross-country flights, being responsible for that sortie's route, clearances, planning and communications.

THE FUTURE

The government's Integrated Review (IR) 'Defence in a Competitive Age' – released in March – announced plans for the RAF to retire its remaining fleet of 76 Hawk T.1 aircraft by 2025. Although the RAF's fast jet training is now

predominantly carried out with the T.2 variant of the Hawk the older T.1 is still used by 100 Sqn in the aggressor role and by the Red Arrows.

"We're planning to be using the T.1 for the conceivable future" reassures Tom, "and we have plans in place to keep flying the jets until 2030 and beyond.

"Actually, some of the messages that came out of the IR with regard to 'Global Britain' and 'Promoting our Prosperity' mean that the team is more relevant now than it has ever been in terms of touring the UK and the globe representing 'UK PLC'. Therefore, we are reasonably reassured of where we stand for the next ten years." □

The team has remained in a 'bubble' during lockdown, so training has been able to continue. (All via RAFAT)



THE INTERNATIONAL BOMBER COMMAND CENTRE

By Liveryman AVM Paul Robinson (IBCC Trustee)

The story of RAF Bomber Command is woven into Lincolnshire's fabric. At any time during World War Two, 70,000 personnel were based on the County's 27 bomber airfields, most within 20 miles of Lincoln.

From famous missions such as Operation *Chastise* (the Dambusters Raid) to Operation *Manna* (the dropping of 6,680 tonnes of food to starving civilians in German-occupied Holland) and Operation *Exodus* (the repatriation of 72,500 prisoners of war) to the almost daily sorties flown over enemy territory the work of Bomber Command richly encapsulated its ethos of innovation, flying skill and courage.

The Battle of Britain Memorial Flight Lancaster overflies the IBCC Memorial. (All via IBCC)



In 1939 our bomber crews, flying obsolescent types like Battles, Hampdens and Whitleys, suffered horrific losses during daylight raids in France, Belgium and Germany. Switching to night operations brought sustainable attrition levels but, in darkness and using primitive nav aids, crews could barely find small targets like factories let alone hit them. Thus the 1942 Area Bombing Directive changed the focus to industrial towns: they were easier to find and, learning from the Blitz on British cities, scientists assessed that consequential damage to factories, infrastructure, and workers' accommodation would significantly reduce industrial output. Born of national desperation, this policy resulted in much post-war angst but having watched the Luftwaffe bomb London and Coventry, the British felt differently in 1942.

Results improved slowly at first but gathered pace after the introduction of modern heavy bombers. Stirlings, Halifaxes and Lancasters were built in ever-increasing numbers and their weapon systems became staggeringly impressive. By 1943, new tactics were transforming mission effectiveness: 'thousand-bomber' raids saturated target defences and 8 Group's Pathfinders marked targets for the main bomber force enabling accurate, concentrated targeting. Meanwhile, the Flying Fortresses and Liberators of 100 Group jammed ground radars while Mosquito 'intruders' harassed night-fighter airfields and night-fighter Mossies, using night-vision binoculars and passive radar/IFF detectors, silently stalked their German counterparts. Some bombers carried linguists to deceive German air defence nets: many were German Jews whose fate, if captured, was uncertain; their courage remarkable.

DEVASTATING LOSSES

Unsurprisingly, considering the technology and tactics involved, it took 18 months to train a Lancaster crew and while Allied air supremacy meant day-bombing had become a survivable proposition by mid-1944 overall losses remained stubbornly high. Of the 125,000 Bomber Command aircrew, 55,573 (44%) were killed, 18,403 wounded and 9,838 captured.

To apply perspective: alongside the RAF's 537 fighter



casualties during the Battle of Britain, Bomber Command lost 749 aircrew, mostly on ops against invasion harbours and airfields. Later in the war the Command lost 545 men in a single night during the Nürnb erg raid of 30th/31st March 1944.

That's statistics; let's look at people. Wg Cdr Ted Porter DFC*, OC 97 Squadron, was Master Bomber for a raid near Bremen on 17th/18th August 1944. His Lancaster was hit after an hour orbiting the target. Handing over to his deputy, he finished: "*I'm afraid we have had it. I shall have to leave you now. Bailing out. Good luck everybody.*" None of the crew survived. They are just seven of the 55,573 aircrew lost, all recorded in Rolls of Honour held in Lincoln and Ely Cathedrals and York Minster. Not just Brits: of the Command's 126 squadrons, 15 were Canadian (6 Group), eight Australian, four Polish, two New Zealand, two French and one Czechoslovak. Additionally, individuals from 62 nations were embedded in RAF squadrons. Over 17,500 Commonwealth and allied Bomber Command aircrew failed to return, including 10,183 Canadians (25% of Canada's military casualties), 4,089 Australians, 1,703 New Zealanders, 977 Poles, 218 French, 68 Americans and 34 Norwegians.

The chance of baling out of a crippled Lancaster was 8% and 55% of aircrew were killed during their first tour of 30 operations; worse odds than Great War infantry subalterns. Yet, all volunteers, they flew on, watching friends die, knowing their turn would come. Survivors often volunteered for second and third tours. Their valour was recognised by 23 Victoria Crosses and countless other awards.

However, it wasn't only aircrew who suffered. There would be 2,000 engineers, ops and admin staff on a bomber airfield. Many were women; WAAF parachute-packers were understandably popular. They all risked their lives in fires, explosions, air raids etc. There are 2,288 of them on our Memorial, including Dorothy Robson, a weapon-system scientist; her trials bomber went down over Yorkshire. The youngest is Air Cadet Peter Bond, lost on an air experience flight aged 14.

REMEMBERING THE MANY

These achievements and sacrifices are now better appreciated. Thanks largely to Past Master Malcolm White we now have the Green Park Memorial in London and the RAF Museum's Bomber Command Hangar.

Lincolnshire already had some excellent squadron museums as well as the Lancasters at East Kirkby and BBMF. Nevertheless, our Past Lord-Lieutenant, Tony Worth, felt 'Bomber County' should have a world-class memorial



Deep in thought, veteran Johnny Johnson (the last Dambuster) pays his tributes at the memorial.

and visitor centre to show coming generations the courage and suffering of those involved on both sides, and he launched the International Bomber Command Centre (IBCC) project in April 2011.

Tony's legacy now sits on high ground close to RAF Waddington, enjoying panoramic views north over Lincoln. The Memorial is a spire of Corten steel, which weathers to a dark-orange protective patina, surrounded by 271 Corten panels on which are incised the names of the fallen 57,861 aircrew and ground personnel. The format is simply name and initials: no ranks or decorations; all of one company.

The Spire reflects the Lancaster's shape and dimensions: two aerofoil 'wings'; 102 ft high, 16 ft chord. It frames the view of Lincoln Cathedral: the last landmark for so many crews, and the first sight of home for those lucky enough to return.

VISITOR CENTRE

The visitor centre is named after Avro's wartime Chief Designer Roy Chadwick and again its shape was inspired by the Lancaster. Incorporating green technologies like solar panels, its glass walls provide a light, spacious interior. The main exhibition hall features full-size holograms of young servicemen and women, played by students from Lincoln University, who recount RAF and German veterans' stories, and a giant screen projects a map of Europe showing the chronology of *Luftwaffe* and RAF bombing operations.

Another hall depicts life on the British and German home fronts and includes moving letters from veterans and relatives. Most exhibits are digital to allow easy updating, not least to accommodate changing school syllabuses. Educationalists classify the subject as 'difficult heritage' and insist on a balanced perspective; that said, our policy is



The spire is surrounded by 271 panels on which are incised the names of the fallen 57,861 aircrew and ground personnel

never to dishonour the memory of those whose names are on the Memorial. There is no 'hardware' at the site: sister museums can display aircraft better than we could. A small charge is made for seeing the exhibitions but otherwise entry is free.

The Chadwick Centre also houses a digital archive, curated in partnership with Lincoln University. It's already the world's most comprehensive virtual collection of Bomber Command personal data, photographs and stories. Memorabilia is delivered to the Centre and elsewhere, scanned, then returned immediately. So far, we've catalogued 1,780 personal testimonies and 255,000 documents such as logbooks and letters. The centre's Losses Database details every person on the panels with the circumstances of their loss. Both resources are free to access, and they registered 68,000 on-line visits in their first 6 months. The surroundings are laid out formally: the International Garden commemorates the nations whose people served in the Command; the Lincolnshire Peace Garden features 27 lime trees, one for each Lincolnshire bomber airfield.

The IBCC officially opened in April 2018, six months after Tony Worth's untimely death. More than 5,000 guests and 312 veterans were on hand for the ceremony and since then, COVID-19 closures apart, the IBCC has proved immensely popular. The 25 paid staff and 450+ volunteers have already welcomed 220,000 visitors from 21 nations including 8,000 schoolchildren and hosted many memorial services, concerts, conferences, receptions and Service dinners.

FUNDING THE FUTURE

In recognition, the IBCC has been awarded numerous accolades and awards, however money remains an issue. We'd raised all bar £2 million of the £16 million project costs with the building phase approaching completion. It would have been expensive to pause construction, and with a major Service charity generously offering to make up the shortfall, we took bridging loans to complete the work.

Regrettably, the charity then withdrew its undertaking and while the centre's income is normally sufficient to cover loan interest and running costs, it is not enough to repay the capital. Online sales and Government support have kept us afloat during COVID and we are confident that visitors will return in strength once we re-open, but we are fundraising hard to pay off the loans and to commission new exhibitions without which visitor numbers would inevitably decline.

These will showcase subjects including the pre- and post-war periods from the Command's formation in 1936 to its disbandment in 1968: nuclear deterrence and air-air refuelling will make particularly compelling stories. Then our work will be done, but what about the Falklands' *Black Buck* missions and the bombing campaigns in the Gulf, the Balkans, Afghanistan, Libya and Syria?

The certainty is that the skill, courage and sacrifice of the RAF's bomber communities need remembering and celebrating, and their stories recording for generations to come. This is the vision of the International Bomber Command Centre, and we are determined to achieve it. But if you find the odd £2 million down the back of your sofa... Find out more at www.internationalbcc.co.uk. □

THE 2021 COBHAM LECTURE

“Towards Zero-Emission Flight and the Fastest Electric-Powered Aircraft”

Report by Assistant Steve Bridgewater

In what is hoped to be one of the Company's final 'virtual' events before the world returns to some sense of normality 110 Air Pilots and their guests settled around their desktops, phones and tablets on the evening of 27th April for the annual Cobham Lecture.

This year, as the aviation world turns its collective attentions towards ever 'greener' and more sustainable methods of flight, it was fitting that the keynote speakers were from Rolls-Royce's ACCEL programme, which is short for 'Accelerating the Electrification of Flight.'

Rolls-Royce Electrical (RRE) Commercial Director Matheu Parr and Chief Test Pilot Phil O'Dell spoke engagingly and offered enlightening insights into the future of electric flight. As Matheu explained early in the lecture, RRE is a newly formed business within the Rolls-Royce group focused upon delivery of complete electrical propulsion systems to a rapidly growing aerospace market. The proliferation of Urban Air Mobility (UAM) and all-electric vertical take-off and landing (eVTOL) aircraft under development offers huge opportunities, and the company recently announced a partnership with Tecnam for the development of the P-Volt: an all-electric, twin engined passenger aircraft.

Matheu emphasised that the electrification of flight is an important part of Rolls-Royce's sustainability strategy and supports the company's aim to contribute to a net zero carbon future by 2050.

SPIRIT OF INNOVATION

Of course, one of the most high-profile electric aircraft of all time is the *Spirit of Innovation*. Phil O'Dell (PoD) will be at the helm when this sleek racer takes to the skies - possibly by the time these words are read - and the pilot aiming to break the world speed record for electric-powered aircraft.

PoD provided attendees with a first-hand account of the aircraft's development, systems and explained how the flight testing and record attempt would be undertaken.

The aircraft, which is now registered G-NXTE, is based on John Sharp's Lycoming TIO-540-powered Nemesis NXT Reno Racer, which cruises at 325mph, set the FAI class C1b world record for speed over a straight 3km course at 356.33mph and qualified for the 2009 Super Sport class at Reno at 412.554mph.

On G-NXTE the 350hp Avgas-burning engine is replaced by a 500hp (375kW) electric powertrain and the latest energy storage technology. At the time of the lecture, the aircraft had completed taxi trials at Gloucester (Staverton) Airport and was about to be transported to Boscombe Down for its maiden flight.

Having flown a 'standard' NXT as part of his preparations, PoD commented that its handling was remarkably similar to Rolls-Royce's Supermarine Spitfire PR.XIX and in all likelihood he would fly the Spitfire immediately prior to strapping into the *Spirit of Innovation* for its first sortie.

Both Matheu and PoD were very candid and open throughout the lecture as well as the enjoyable Q&A session hosted by the Clerk and the Master. When asked when the speed record attempt was likely to occur, they would obviously not be drawn on a specific date but indicated that it would be very soon after the maiden flight. Having done so much development, evaluation and simulation the team is in little doubt about how the racer will fly, so all that's left to do is to go out and break the record.

If you missed the lecture – or just want to watch it again – you can view it in full at: www.airpilots.org/about-the-company/lectures-and-presentations/ □

The colour scheme that adorns the Spirit of Innovation was designed in the spirit of the British entrants into the Schneider Trophy air races of the 1920s and 30s. (Rolls-Royce)



Matheu and Phil (Bottom) take questions from the audience, expertly fielded by both the Master and the Clerk.

OXFORD v CAMBRIDGE THE VARSITY AIR RACE

By Assistant Steve Bridgewater

Assistant Steve Bridgewater looks back at the Oxford v Cambridge Air Race – a century on from its one and only running

Just three years earlier they had been tangling with the Hun in the skies over Europe, but in the summer of 1921 a band of Oxbridge students found themselves deep in study towards their postponed degrees.

Thoughts frequently returned to their flying days and the need to keep their adventurous spirit alive. It was then that former test pilot and current Oxford student Alfred Reginald Boeree came up with a plan to hold an Oxbridge air race, after all there had been a boat race since 1829 so why not, he reasoned, an air race.

A plan was hatched and the Royal Aero Club provided the money to hire eight Royal Aircraft Factory SE5a aircraft registered G-EAXQ-XX. Six of these (three per university) would make three laps of a 129-mile course from Hendon to Epping and Hertford before returning to Hendon – the other aircraft would be held as spares.

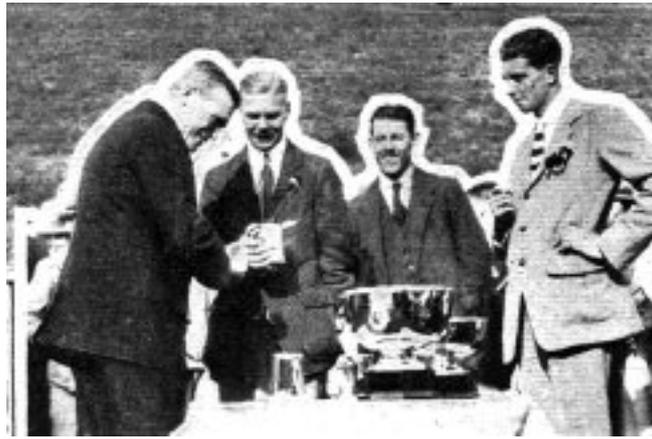
Students who had flown the SE5a during the war were invited to apply for team selection and organisers were swamped with interest. Finally, each university picked a team of six pilots, three of whom would fly in the race, the others being held in reserve. Oxford was represented by Boeree (Oriel College), Noel Grattan Pring (New) and Alfred Vincent Hurley (Keble), and Cambridge by Hugh Arthur Francis and William Stuart Philcox (both Caius) and Robert Kilpatrick Muir (St Catharine's).

Prize money totalling £400 (a little over £20,000 in today's money) was contributed by wealthy aristocrats and the Anglo-American Oil company and the Royal Aero Club incorporated the Varsity Air Race into its programme for the Hendon Aerial Derby on 16th July 1921.

The day dawned hot and dry but only a small crowd turned out at Hendon to watch the six pilots prepare to take off. Oxford's aircraft had been painted with dark blue tails and Cambridge had the university's light blue.

*The Cambridge aircraft had their tails painted light blue whereas the Oxford team sported the university's dark blue.
(All Awyr Aviation Archives)*





The Home Secretary, Edward Shortt KC, presents the Cups to the winning Cambridge Team; Hugh Francis, William Philcox and Robert Muir.

STARTERS ORDERS

The aircraft lined up under starter's orders as the Duke of York, the future King George VI, looked on eagerly. The SE5as took off in a loose formation and roared off in unison at 2.30pm. However, one Oxford pilot was deemed to have made a false start and had to orbit the field and cross the start line again in pursuit of the other five, with the Cambridge entrants climbing to find cooler air. Meanwhile, the Oxford boys sped off at treetop height looking for white crosses laid in fields to mark turning points.

Even at speeds close to 120mph it would be 20 minutes before the crowd at Hendon got another glimpse of the racers as they rounded the home pylon and began their second lap. At this stage Philcox and Muir held first and second places for Cambridge, with Boeree in third place for Oxford.

When they returned the next time Philcox – flying G-EAXU (ex-F5333) - held onto his lead but now had Oxford's Pring in hot pursuit in G-EAXW (ex-F5259). Pring would continue chasing down his competitor until an ignition lead broke and he was forced to land in a field near Epping. Now unchallenged, Philcox was able to coast over the finish line; his SE5a averaging 118.55mph over the 387mile course. He was followed by his two Cambridge colleagues to give the university a clear win, with Oxford's entrants coming home fourth and fifth – ironically Boeree, who had thought up the whole thing, was the last man to land.

There were hopes that the race would become an annual event but the low turnout of spectators and a lack of sponsorship meant that was not destined to be the case. Unless any of our Young Air Pilots feels inclined to resurrect it ...?

The aircraft roar away from the start line.



INTO THE OVERSHOOT

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

BUCHON TV STAR

Liveryman John Romain MBE was among the pilots taking part in the first British airshow of 2021. He flew the Propshop Ltd-owned Hispano HA-1112A Buchon at the Shuttleworth Collection Season Premiere on 2nd May. The Buchon - which is a Spanish licence-built variant of the Messerschmitt Bf109 albeit with a Rolls-Royce Merlin engine - was still wearing the temporary markings applied for its role in the new BBC series *SAS: Rogue Heroes*. Based on Ben Macintyre's book of the same name, the six-part series is being produced by *Peaky Blinders* creator Stephen Knight and stars Connor Swindells as David Stirling, an eccentric young officer desperate for action after being hospitalised during a training exercise accident in Cairo, 1941. Convinced that the army commando units are failing, he formulates a radical plan to recruit the nation's toughest and brightest soldiers for a small undercover unit. Subverting all the traditional rules of modern warfare, the rebellious and heroic SAS crew are set a mission to create as much mayhem behind enemy lines as possible. Of course Buchons are no strangers to film and TV fans as they have appeared as Luftwaffe Bf109s in productions as varied as *Battle of Britain*, *Memphis Belle*, *Piece of Cake* and *Dunkirk*. (Steve Bridgewater)



40TH ANNIVERSARY CHINOOK

The Boeing CH-47 Chinook entered RAF service on the 22nd November 1980 and this year that anniversary is being belatedly celebrated by 27 Sqn at RAF Odiham. This commemorative paint-scheme – designed by current Chinook pilot Flt Lt Andy Donovan – has been applied to ZD984 and was unveiled on 5th May. As well as conducting routine training for operations in the UK and overseas the specially painted Chinook will support the RAF Chinook Display Team's season and commemorative events throughout 2021.

According to the MoD the design took two years of groundwork and engineering preparation before ZD984 entered the paint bay at Odiham. A dedicated team from Serco worked over several weeks to apply the special commemorative livery but the MoD emphasises that the scheme was applied during regular scheduled routine maintenance at no additional cost.

The RAF's Chinooks have taken part in every major conflict since the Falklands War. Look out for a special feature covering the remarkable career in the next issue of *Air Pilot*. (Crown Copyright)



A HEAD FOR HEIGHTS

The RAF Museum Cosford's annual high-level aircraft cleaning and inspection days took place on 29th-30th April in readiness for the site reopening to the public on May 17th. Work focused on the suspended aircraft displayed within the museum's National Cold War Exhibition and was carried out by Arco Services, specialists in working at height. In addition to cleaning the aircraft, the team also carried out safety checks on the suspension cables. (Paul Bunch – Perspective-i)

