



Air Pilot

JUNE 2017 ISSUE 21





AIR PILOT

THE HONOURABLE
COMPANY OF
AIR PILOTS
incorporating
Air Navigators

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:
Captain C J Spurrier

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Diary

JUNE 2017

15th	General Purposes & Finance Committee	Cobham House
26th	Election of Sheriffs	Guildhall
27th	Trophy & Awards Committee	Cobham House
28th	AST/APT meeting	Cobham House

JULY 2017

11th	AP Benevolent Fund	Cobham House
17th	Summer Supper	Tallow Chandlers' Hall
18th	ACEC meeting	Cobham House
20th	General Purposes & Finance Committee	Cobham House
20th	Court	Cutlers' Hall
26th	Pilot Aptitude Testing	RAF Cranwell

AUGUST 2017

19th	Summer Garden Party	Charlton Park
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VISITS PROGRAMME

Please see the flyers accompanying this issue of Air Pilot or contact Liveryman David Curgenvin at visits@airpilots.org.
These flyers can also be downloaded from the Company's website.
Please check on the Company website for visits that are to be confirmed.

GOLF CLUB EVENTS

Please check on Company website for latest information

Cover photo: A Merlin lights up the sky at the 2016 Air Day at RNAS Yeovilton

A message from your Editor...

Journalists cannot complain for want of news at the moment. Political upheaval seems to have spread like malware around the globe, with the UK doing its bit with the PM calling a surprise election. The main job of governments – to enact and supervise legislation that fulfills current needs – is in abeyance, and this affects aviation, as other industries. And in our world, a major European airline has crashed and burned, whilst, as I discuss elsewhere in this magazine, a raft of upstarts threaten to invade our airspace. No, life is not dull just now.



I have just returned from a weekend of competition in France, which reminded me of how collegiate is our craft. Our Flying Club's annual programme has passed. Its events, and of course many of the Company's own events, underline the very social side of our profession, hobby, and sport – long may it remain so. I am very grateful to those who put pen to paper (and raise their cameras) at the visits organised by the Company. But I continue to welcome articles for publication on any aspect of aviation which you think might be of interest to members. Even if your English may not be an exact replica of that used by our dear Queen, fear not – the Editor's polishing cloth is at hand!

Paul Smiddy - Editor

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News Round Up

PAT TURVEY'S FLYING FAREWELL

As part of Pat Turvey's leaving gifts the Company arranged a flight over her home area. After scheduling and weather delays this was recently completed when Court member Richie Piper flew Pat in an RV8 from the restored WW1 airfield of Stow Maries. Pat was accompanied by her daughter and granddaughter, and after a briefing over a cup of tea in the mess, the flight began. The route was along the coast to Clacton pier, thence to Brightlingsea, Maldon and Chelmsford before orbiting over Pat's house. Pat and family also enjoyed looking around the restored WW1 buildings and museum at Stow Maries where Pat made friends with another pilot.



AIR DISPLAY UPDATE FROM BADA

At its AGM BADA agreed that a Business Day was required to improve the management of British airshows. It undertook to host this free of charge. It is now scheduled for 29th July at Duxford.

The outline programme, running from approx 1000 to 1630 currently is designed to address 5 questions:

1. How does parliament/government view airshows? - dependant on the outcome of voting on 8 May!
2. How do we maximise the performance of our events? - including sponsorship, etc.
3. How do we manage risk in the post-Shoreham world? - we hope to have something from the Health & Safety Laboratory (HSL) who wrote the report on the Shoreham RA
4. Can display pilots offer event organisers a more economic service? - and what are the current difficulties pilots face?

5. How do others (e.g. HAA, LAA) view UK airshows? - e.g. HAA, LAA

6. What has been tried in the past? - What next for BADA?

Each of the first 5 question sessions will include 10-20 minutes for open discussion that will guide the last session on the Association's future.

FLIGHT INSTRUCTOR UPDATE

Steven Pearson, one of our first two Flight Instructor Apprentices with FTA Global at Shoreham has provided the following update on his progress. It was a mixed blessing when he was selected to join Loganair as we had hoped he would progress a little further with his instructing. However, as you will see below, the good news is that he plans to continue with Flight Instruction as an addition to his airline duties.

"In Spring 2014 I qualified as a Flight Instructor through an apprenticeship provided by the Honourable Company of Air Pilots. Since then I have instructed for FTA Global, a commercial flight

school in West Sussex, gaining more than 800 hours instructing experience. More recently, I've got a job as a First Officer with Loganair, based in Inverness. The job is fantastic and very challenging. We fly in a lot of difficult weather and challenging terrain around the islands of Scotland.

Instructing is something that I have a real passion for and it's a great feeling to see one of your students achieve something such as their first solo flight. This particular apprenticeship went above and beyond the normal FI course. There were several other elements built into the course that allowed me to experience the day to day operations within the school and talks on tips for instructing from RAF pilots. One thing that especially helped was being around other instructors whilst I was going through the course. It meant that if I had any questions, needed any tips or had doubts about weather during the early stages of instructing, it was there at hand.

I've taught a variety of training such as

the PPL, Night Rating and Integrated courses. One of highlights of my instructing career was when I was involved in helping set up FTA Global's new satellite base in Teruel, Spain. I was out there in August/September 2016 flying a PA28 around the mountains, teaching the Integrated course. It was an awesome experience and all 4 new students completed their first solo flight in the minimum 10 hours, which I felt was a real testament to the FI training and experience I gained.

I'd highly recommend instructing to anyone, especially if they're newly qualified. It's given me improved flying skills, increased situational awareness and a much better knowledge base. It will also open many doors allowing you to move onto teaching CPL, IR, Multi-engine courses and lots more! That's my plan now that I've settled in Inverness. I started building IR hours while at FTA Global in the hope to do the IRI upgrade course which would allow me to teach the Instrument Rating."

INSURANCE

Anyone who has had to insure an aircraft 'hull' will know that the London aviation insurance market (which like the rest of Lloyds is a market of global stature) is very concentrated. In my experience an approach to one broker will soon mean that most of the very small number of underwriters are aware. So perhaps we should take some comfort that the UK's Financial Conducts Authority initiated an antitrust investigation into the aviation broking sector in April. It was reported that the FCA made a co-ordinated series of dawn raids on the premises of Aon, Jardine Lloyd Thompson, Marsh, Willis Towers Watson and UIB.

MIND THE (GENDER) GAP

The International Society of Women Pilots has recently pointed out the massive differential in flight deck representation between the sexes. It affirms that globally there are only 450 female captains against 14,400 males. In the UK easyJet is perhaps at the vanguard of promoting piloting careers to women, yet it recently disclosed that its female

employees earn 65% less than its male (no doubt heavily skewed by the bias of cabin crew). The US-based network Women in Aviation notes that the growth of total (i.e. including private) female pilots in the USA has stalled in recent years, and judges that presently only some 4-5% of US commercial pilots are female.

EasyJet did however manage to launch an all-female crew for a service on International Women's Day this March. A year earlier Royal Brunei Airlines had managed the same achievement - ironically with a flight to Saudi Arabia - where of course women are forbidden from driving! There is scope for much more progress....

THE AIRLINE INDUSTRY

Worthy of note that Alitalia has fallen into administration since our last issue. And Emirates has recently reported its first profits fall (-70%) in five years.

THE SAGA OF ST. HELENA'S AIRPORT CONTINUES

On 3rd May 2017, a BAe 146 Avro RJ85 made a small piece of history when it became the first commercial passenger-carrying flight into the new airport. This was rather forced on the Government because the merchant ship which provides the normal link with South Africa had technical problems. Air Partner sourced the RJ85 for SA Airlink, which had to stop in Windhoek for refuelling on its way from Cape Town.

RAF CLUB LUNCH - FLT LT COLIN BELL

Although not a HCAP event, chairman of the Club's Events Committee, Upper Freeman Andy Richardson, organised a fantastic lunch at the Club in May. Air Pilots who are Club members who did not attend missed a treat. The speaker was Flt Lt Colin Bell, who, as Andy remarked, at 96 was older than the Duke of Edinburgh. Colin joined up in 1940, when, as he pointed out, Lord Halifax was urging his fellow Cabinet members to start peace negotiations. After flying training in Hawaii (must have been more enjoyable than soggy England!) he

became a creamie QFI. In 1943 he returned to the UK and flew 30 ops in Mosquitoes with the Pathfinder Force. The bulk of these were over Berlin, and this provided the focus of his talk.

Eschewing a microphone, Colin was forthright, lucid and engaging - totally belying his age. What were bombing missions over Berlin like? "Pretty alarming!" Although like the rest of Bomber Command, the underlying risk was overwhelming with only an overall 25% chance of surviving a 30 op tour, Colin felt lucky to have been posted to Mosquitos. These could outrun anything else in the skies - apart from the Me262.

Aside from the Mossies' vicious swing to port on take-off, he found it delightful to fly. He was however always conscious of the small size of the armour plating behind his back: he soon found the accuracy of the Wehrmacht's radar-guided 88 anti-aircraft guns (firing at 15-20 rounds per minute up to 30,000') rather disturbing! Colin was based at RAF Downham Market with 608 Sqn, whose OC exhorted Colin and his colleagues "Live everyday as though it will be your last, and one day you will be right!". Basic instrumentation told the pilot when he was subject to a lock from either ground or nightfighter radar. If the latter was a Me262, evasion tactics had to be immediate and extreme.

Colin was very supportive of his commander, Bomber Harris, and related the Post-War testimony of Albert Speer, which confirmed the debilitating effects of Bomber Command's efforts on the German economy. He reminded us of the observation by the late and much missed Spike Milligan - "The German sense of humour is no laughing matter"! This was a fascinating talk, which was a privilege to hear.

The Master's Message

Captain Chris Spurrier

Time, they say, flies by when you're having fun. Just over four weeks from my installation I'm wondering where the month has gone. Our AGM is neatly arranged to give the new Master an incredible week. There's nothing worse than reading about the wonderful time someone else has had but I'll tell you anyway, if only to encourage you to consider standing for election to the Court.

Installed on Monday, I was back in the office on Tuesday for a meeting and then I was generously allowed Wednesday free. On Thursday afternoon Paula and I were at Guildhall. The Livery Schools Link had encouraged schools to become involved with an exhibition called "Echoes Across the Century". This exhibition, which commemorates the losses in the First World War, is built around artist Jane Churchill's installation *Degrees of Separation*. 240 students were involved in producing a series of cameos featuring the lives and deaths of the combatants and the equipment they used, which is where the Livery Companies became involved. "Our" school had designed a stand featuring aerial combat and the RFC. There were many others – Saddlers and Farriers for the transport and cavalry horses, tin plate workers for the ration tins, Leather Sellers for the boots and so forth. The whole exhibition was very moving and is well worth a visit. Our representative on LSL, Warden John Towell, had been involved from its inception and had asked me, with other Masters, to present certificates to the schoolchildren who had created the exhibits.

From Guildhall, back to the RAF Club to change. That evening Paula and I were at the Mansion House for the Lord Mayor's dinner for Masters and their consorts. The expression "glittering occasion" is greatly overused but this truly was one. I am pestering our Clerk for State Trumpeters at the next T & A but he's being very mean with the Company's finances. Back to the RAF Club for the night and on Friday morning off to St Paul's for the annual United Guilds Service, followed by lunch at Stationer's Hall. Feeling slightly overfed, we arrived home for a gentle

Saturday before Sunday morning at St Clement Danes for the RAF 99th anniversary service, followed by a reception at the Law Courts. As a first week, it's a full-on induction for what is becoming a busy and food-packed year. A Past Master once described it as "Eating for the Company".

It was very pleasing to return to the Mansion House two weeks later for the launch of the Institute for Apprenticeships. Apprenticeships had fallen into disuse over recent years but at last their value is once again being appreciated. As one who grew up in an earlier age it seems strange that apprenticeships were ever allowed to disappear but it's good to see them back and this new Institute seems to have the drive to make things happen. Strangely, the most prominent supporters I spoke to seemed to come from the financial services industries. A far cry from the engineering and artisan apprenticeships of my day but I am sure all industries will take this initiative on board. From our standpoint, Past Master Roger Gault's work for pilots can only benefit from this new organisation.

On to more general matters: I was greatly heartened to read in the newspapers of the surfer rescued thirteen miles from the coast of Scotland after thirty hours adrift. It is good to know that the crews of our Search and Rescue helicopters are still doing such a wonderful job. Hunting for a tiny target in a vast expanse of sea demands enormous concentration over a very long time. This crew did a wonderful job and I salute them all.

Those of you who struggled through my first Master's Message know of my concerns at the lack of emphasis on STEM subjects in our schools. STEM, you will recall, stands for Science, Mathematics, Engineering and Technology. At a recent meeting I was told that STEM has become STEAM, thus now including Arts. When I heard this, steam was certainly coming out of my ears for a short while. It is the lack of scientists and engineers which should be concerning us. (I was reminded of a USAF pilot with whom I used to fly, who had an expression about Custer needing more Indians). I recently

attended a postgraduate awards ceremony at Imperial College, where graduands were receiving Masters degrees, Doctorates and so forth. Just as a quick snapshot I went through the lists of the Aeronautics, Electrical/Electronic and Mechanical Engineering departments. Respectively they had 108, 155 and 142 names listed. Of these, again respectively, there were 15, 11 and 27 who had Anglo-Saxon names. Overall, that's about 10%. I know that names are not a true indicator of nationality or of parentage, and I know that Imperial takes a huge number of foreign students, but it does suggest, perhaps, that we in Britain have a different attitude towards what are seen as the more challenging subjects, or indeed towards education generally. So please, let us concentrate on STEM. Those are the subjects our country needs in order to prosper.

On a lighter note, the week before this ceremony I had been at Imperial with the visit organised by Liveryman David Curgenvin. This was what Wallace and Grommit might have described as A Grand Day Out. I'm sure there will be a full account of the visit elsewhere but I mention it to plug the visits program. There is no doubt that these are an excellent way for members to broaden their horizons and to meet others in an informal setting. I would encourage everyone to apply for any visit they might find interesting.

Another recent highlight was the meeting of the Luncheon Club, now under the management of Past Master Chris Ford. His predecessor, Liveryman and former Assistant John Robinson, had done a magnificent job over many years and is deserving of our thanks. I wish him many years of sitting watching someone else doing the work! The lunch was, of course, followed by the Cobham Lecture by Tristan Crawford of Aerealis. A very interesting lecture on a very exciting project. I'm sure that lecture will be covered elsewhere, too. By a strange coincidence I was sitting next to Tristan's mother at a dinner just a few days ago.

Time for me to sign off. Spring seems to be happening – at least, my lawn is growing – so I wish you all a pleasant summer and, if you're flying, clear skies and calm breezes. May the numbers of your take-offs equal the numbers of your landings.

From the Desk of the Director Aviation Affairs

Liveryman John Turner

In the 4th Century BC, Aristotle said, "While everything changes, everything remains the same as well". What a clever chap he was; since the last edition, much seems to have happened but advances seem few.

In the UK, our civil and military regulators finally published their new air display rules on 3rd May. Much has changed – both documents completely re-written in new formats – but much is as before. For the unwary, there are still some of the old differences between civil and military requirements, such as lateral separation of spectators from the runway, and new differences like the manoeuvres permitted while ‘blending’ between flypast and aerobatic height minima. However, the differences belie considerable convergence. At working level, both regulatory teams have tried for similar requirements described with similar words; we should recognise their efforts and encourage even further in the future, albeit small differences to permit the military their ceremonial and force demonstration activities are probably inevitable. Convergence is evident in the R/T safety calls now mandated by both military and civilian rules. “TERMINATE” is used to stop a display for flight safety reasons (intruder aircraft, flock of birds, etc.), formal warning calls are “TOO CLOSE” and “TOO LOW” and a Flying Display Director with concerns over a pilot’s performance or compliance with the local air display rules is required to call “STOP.” A STOP call is also mandatory in place of a third warning call and means not only that the pilot must stop displaying immediately but that their display approval is cancelled pending a successful review with their military supervising chain or the CAA.

Now, all UK air displays will have a ‘Display Area,’ from which non-essential personnel are excluded; display pilots may only fly down to minimum display height in the Display Area. Outside the Display Area, pilots must fly in accordance with the normal rules of the air so that people and property outside the Display Area have the same degree of protection as is provided throughout the UK. This is a variation of a North American concept but its implementation in a country that lacks the enormous airports and wide open spaces of USA and Canada is not without some risk, if only to display pilots. The Display Area is driven by local conditions such as roads, railways, cities, towns, hamlets and isolated occupied buildings. Display pilots will need to know when they are inside and when they are outside the Display Area which will vary in size and shape from event to event; this will make the task very different from maintaining crowd separation against clearly marked straight lines on the ground, or natural features such as runways and taxiways. Not only will it be more difficult for display pilots to abide by the new rules but they will be operating with the pressure of knowing they will lose their display flying authorisation if they make a mistake and the need to continually identify what may often be a nebulous display area boundary will continually distract from the primary task of flying safely. It will be interesting to see how Just Culture can be sustained under these conditions. The new rules reflect and do mitigate concerns over third party risk; as a solution, it is far from ideal but it does allow airshows to continue in the UK. Where they can, Flying Display Directors and event organisers will help by

securing and sanitising areas outside their airfields and providing as large a Display Area as possible, with boundaries that follow natural features (or have the facilities to make them easily visible from the air). Everyone involved in the UK airshow season will need a cool, calm head and, more importantly, the additional time to assimilate and prepare for the demands that each event site will now pose. A safe season should at least minimise the likelihood of another set of new rules in 2018.

To return to my opening statement, I note that, following assessment of the operational and security implications and in accordance with the options in EASA rules introduced after the GermanWings accident, the airline SWISS no longer requires two people in the cockpit at all times; a change to make things the same! As ever, crew duty rosters and fatigue remain areas of serious concern. We know that fatigue degrades performance as much as, if not more than, alcohol. Yet with the change from ‘2 off in 14’ to EASA’s ‘2 blocks of 2 days off each month’ we now see instances of people being rostered for scheduling one 2 day break at the beginning of the month and the next at the end; even God had one day off every seven! To compound the issue, some airlines now record a pilot reporting fatigued as being off sick, which hides the real issue and seriously disadvantages the honest reporter if sickness rates are used when deciding which personnel to ‘let go’. We have investigated whether there was scope to incentivise airlines that treat crew fatigue responsibly through reduced insurance premiums (or to penalise the others through increased premiums). Unfortunately commercial air transport is so safe (!) that there are more people wishing to provide airline insurance than there are airlines wishing to buy. Since the fatigue regulations currently in force in Europe do not provide a safety net against fatigue or an airline’s appetite for rostering to the limit, we need to find

another way. In the UK we had an excellent airshow record when it came to 3rd party safety but a tragic accident in 2015 still led to major regulation change, and those changes present challenges of their own. Fatigue features increasingly in occurrence and accident reports, so, unless we can find a way to convince regulators and airline operators, it is only a matter of time before a high-profile air accident in the global arena finally addresses crew fatigue regulation.

Drones are, perhaps, an even more intractable problem; so many people can purchase and operate them and the

systems are increasingly capable. Yesterday I saw a 750-gram drone for sale for £1,000 with an endurance of 27 minutes and operating range of 7 km. Who can see a 'hobby' drone at 7km? The drone risk to manned aviation cannot be resolved by regulation alone, as many can/will be operated outside or regardless of regulation. Where regulation is not effective, education can only provide limited. I have no wish to deny anyone the experience of controlling a flying machine nor to inhibit safe exploitation of drone technology. That leaves the challenge of

effective enforcement against those who do not play by the rules so that everyone can stay safe.

After a period of relative quiet since an accident at Farnborough in 1952, UK display flying has become a recent area of focus; however, the threats from lasers, fatigue and drones have been present and in clear focus since my first article; national measures are necessary to improve local conditions but these threats are global and will not be resolved fully until there is coordinated, global, and effective action.

Laser Attacks

By Upper Freeman Air Commodore Dai Whittingham, Chairman, UK Flight Safety Committee

Laser attack is one of the topics that surfaces most frequently in the various safety groupings I attend and is certainly the subject of regular discussion at our UK Flight Safety Committee meetings, at the local runway safety teams for Heathrow, Gatwick and Manchester (other large airports are available) and of course at the Company's Technical Committee. These attacks also feature in the work I do with EASA, DfT and the CAA. Notably, our new Master chose to make specific mention of his concerns about lasers in his first message to the Company.

Just over two years ago, when the CAA's Laser Working Group had been moribund for 2 years, I persuaded the DfT and CAA that an externally-led group would be viable. With the CAA providing the secretariat support, we gathered a wide community of interest that included all the key players needed to ensure we had an approach that was consistent, politically realistic and scientifically sustainable. As well as our esteemed DAA, we had representation

from DfT, Public Health England, Met Police, BALPA, MOD, DSTL, the Department of Health, National Police Air Service, EasyJet, Virgin Atlantic, BA and many others.

While it has been very much a team effort, we have managed to make real progress. Aided by some well-publicised events such as the post-laser attack turn-back of a Virgin aircraft (which gained visibility at the highest levels of Government), and clear evidence of under-reporting obtained via Company and BALPA surveys¹, Ministers were finally convinced that action was required. The workings of Government meant that we were unable to table the complete package of measures the Working Group believed was needed to control the laser problem, but the Vehicle Technology and Aviation Bill (VTAB) was making its way through the Parliamentary system, had successfully passed the Committee stage and was due to go on to the House of Lords. The laser measures were well-received by the Public Bill Committee and,

encouragingly, the only objections raised were that they did not go far enough.

To the intense frustration of all concerned, the 19 April announcement of a General Election has put the VTAB on hold and we now wait to find out if the VTAB will be included in the list of Bills to be completed as part of the pre-election "wash-up" – this is where the normal parliamentary processes are curtailed to complete as much business as possible in the few days prior to formal dissolution. If the Bill is not on the wash-up list, it is lost and we must start again in the next session of the new Parliament.

If the VTAB is finally enacted, it will become an offence to direct a laser at the person at the controls of any form of transport – air, road, rail, maritime and even space and sub-orbital craft. The offence will carry a penalty of up to 5 year's imprisonment or an unlimited fine; it can also be dealt with summarily by magistrates. We will no longer need to prove endangerment or distraction, the simple fact that the laser was pointed at

the pilots of an aircraft will be sufficient to create the offence. This will make the prosecution of laser offences very much easier and, hopefully, will in turn lead to an increase in public awareness and a corresponding reduction in the number of attacks.

Changing the law in this way is not easy, and to have measures included in a Government Bill is a huge achievement for the Laser WG and its members. But the VTAB measures are only the first step as we still need to address permissible power levels, public access to laser devices of all types, and the police powers needed to tackle the problems at street level.

We will be working with Government departments in an effort to institute

import controls on higher-power devices. There is resistance in some quarters because it will not be easy to police; that said, cocaine is illegal and it is almost impossible to stop it getting into the country, but at least we try to prevent it. The same attitude needs to prevail with lasers – it should not be acceptable for a teenager to be able to buy a 5W laser over the internet and import it almost without hindrance when that device can cause irreparable eye damage at ranges exceeding 150m. We believe laser pointers should be treated the same way as knives where minors are concerned and there are strong arguments for including them on the offensive weapons list. The multi-modal nature of the proposed legislation also means that the

case for using (expensive) goggles or filtered windshields as a mitigation for attacks against aircraft is considerably weakened. In any event, using filtered optics addresses only the symptoms and not the disease itself.

In all this work, the successful passage of the new laser laws will be crucial to future progress. Thereafter, the logic for further change is irrefutable: if directing a laser pointer at the person controlling a vehicle is a crime, why would you not also act to reduce the potential impact of that crime on its victim? We hope that Company members will feel able to encourage their MPs to support the current Bill, or its post-election successor, and any subsequent measures designed to reduce the threat from lasers.

GAZETTE

APPROVED BY THE COURT 18 MAY 2017

ADMISSIONS

As Upper Freeman

David Walter BODNER (NA)
Catherine DIETRICH
Gregory Stephen FERGUSON (AUS)
Roy Peter MANN (HK)
Peter Robert John MUNRO-LOTT
Dominic Charles RILEY
Eoin Michael SANDS
Kyle Adam THOMAS

As Freeman

Philip Arthur John BROADLEY
Weiyang Samuel CHEONG (HK)
Oddvar STRAND (OS)
Arnold TAI (HK)

As Associate

Ella Louise DAVIES
Keith Neil WRIGHT (AUS)

REINSTATEMENTS

As Freeman

Glen ROSS (NZ)

Nominated Admission

Lisa D'OLIVEIRA

ACKNOWLEDGED BY THE COURT

18 MAY 2017

REGRADE

To Livery

Captain David Seaton BRAMWELL
Elizabeth Palmer WALKINSHAW

To Upper Freeman

Zoe GELL

DECEASED

Jeremy BUTLER
Maurice HAMMOND
John KESSEY (AUS)
Earnest SEEMANN

RESIGNATIONS

Martyn BLUNDEN
Philip BREEZE-LAMB
John CUTHBERT
John DURNAN
Matthew GREENSLADE (NZ)

Richard HEAD

Timothy HEWLETT

Jan LEEMING

Esther LISOWSKI

Gregory LOUGHLIN-SIMS

Ian MILNE

David RICHARDS (NA)

Gordon TESSIER (NA)

FORFEIT ALL BENEFITS

Robert BACHMANN (OS)

Neil COOPER

Roger COTTEE

Callum GALLOWAY

Jordan GOODWIN

Marc HEAL

Paul HEPBURN

Robin LLOYD

David PELCHEN (OS)

Brian STEIN

Michael WATT

The Cobham Lecture - April 26th

Dart - Tristan Crawford

By the Editor

Like I suspect many of us, Tristan was an avid doodler of aircraft designs when he should have been paying attention in class. I have no doubt his schoolboy designs were a quantum better than mine! After a spell in wing R&D at Airbus, he moved to Boscombe as a trials officer, and left to found Dart in 2010. This is billed as "A New Approach in UK Jet Trainer Design". The company plays up its British heritage, and indeed almost all pictured designs we were shown were clothed in the famous red livery of the Red Arrows.

Clearly UK military flying training is only just beginning a new era (with MFTS). However Tristan gave us his views of the shortcomings of the newly implemented airframes and system (which struck a chord with the audience), and went on to explain that the Dart concepts are aimed at replacing the current new airframes when they reach the end of their design life. Dart's designs are to fill the Basic and Advanced, but not the Elementary stages of the military training system. He set out the mistakes in previous trainer procurement: two of the designs submitted for the AST362 requirement were so complex and expensive that they evolved into strike aircraft. Tristan praised many aspects of the Hawk story – only 4.5 years from contract to delivery, and he was clearly impressed by the prototype still flying when he was at Boscombe Down. He lamented the industry's tendency to increase the empty weight of successive generations of trainers – with exponentially greater increases in cost – Dart is trying to break this chain. He illustrated his beliefs with the contenders for the current US T-X contract.

Tristan's design philosophy of creating a basic design that can be flexed to create

products addressing several markets is clearly influenced by his time at Airbus, and he seeks to achieve scale economies in the manner they have. This leads to a common fuselage with modular wing and engine components. In his view this approach has yet to be seen in the military market. By importing techniques from the motorsport industries, and indeed some of their managers and personnel, he would seek to truncate development timescales. Tristan was impressed with the speed and cost of development of the Air Land Scorpion

(23 months from concept to roll-out), for example. The Eclipse 400 VLJ was even faster.

Dart is avoiding the constant tinkering which is a weakness of many design houses – the baseline concept was 'frozen' in 2015. Low lifecycle costs are a priority selling advantage; and the company is looking for commonality across its products in cockpit design, simulator and support training, spares & maintenance, and logistics & support. Although he sees opportunities for Dart around the globe,



the EMEA market, comprising some 2500 airframes, forms the bulls eye of the company's target. Tristan was postulating that he could provide very material lifecycle cost savings for operators against types currently coming into service.

The current timescale envisages a flying demonstrator taking to the skies by 2019, a flight test vehicle arriving in 2023, with certification and initial production taking place over the following 20+ years. The company appears well advanced in setting out lowest-cost manufacturing techniques.

Tristan pointed out the uncomfortable (and undeniable) truth that Britain's 'whole aircraft' manufacturing capability had declined – the Hawk being perhaps the last of the line. Dart is positioned to halt that erosion. Moreover the company aims to achieve MAA certification that would provide the basis for a healthy export business. The company has now re-branded as Aeralis, and will probably need a partner for the next stage of its progress to market.

Tristan Crawford, and his enthusiasm, reminded me of Richard Noble, the Briton who has spurred British engineering creativity with successive Thrust projects to raise the Land Speed Record. Whilst there are major obstacles yet to overcome, the audience and the Company hope Tristan and Aeralis achieve similar success. The project certainly seems destined to stimulate more interest in STEM education in the way that Thrust has. A most interesting talk, enjoyed by a full house.

The modular approach to achieve 3 variants for different stages of the training regime



Fly2Help

By Freeman Ben Griffiths

Working as a journalist for 20 years and latterly specialising in reporting aerospace and defence matters, I have been fortunate enough to meet some fantastic people in aviation. People who have been more than willing to spend time talking about their passion for all things flying, and who go out of their way to encourage newcomers.

One such person is Helen Tempest, a former wing-walker and daughter of the respected display pilot Barry Tempest – an aviator with more than 2,300 displays under his belt. With such a family background it was perhaps inevitable that Helen would end up in aviation too. When we first met, Helen was running the admin desk at Ultimate High, the aerobatic academy then based at Kemble (now Cotswold Airport). I was at the time a student PPL and had been despatched by my editor to sample a 'Top Gun' profile for a newspaper article.

On that day more than a decade ago Helen was instrumental in ensuring I had a fantastic day out flying with Ultimate High boss Mark Greenfield. Today she is putting her fun-loving personality, strong organisational skills and deep empathy for others to use as one of the driving forces behind aviation charity Fly2Help. She has even managed to persuade me to get involved as a volunteer and I haven't regretted it for a second.

The brainchild of former RAF fast jet pilot and Rolls-Royce test pilot, Phill O'Dell, Fly2Help takes everything that is exhilarating about flying and uses it to do something extraordinary. Who, after all, can forget the smile on a novice passenger's face the first time you take them flying? It is this sense of fulfilment – along with dedicated people like Helen Tempest – which together have helped Fly2Help to thrive. Now a decade old, the organisation was established with the aim of using the power of flight to raise the spirits of people young and old, living in difficult personal situations and also to inspire young people as they consider their future lives.

Every year at airfields around the country a team of keen pilots and volunteers to help out on the ground give up their time to provide very special experiences for others who at times are facing the



most difficult things life has thrown at them. This could be the recent bereavement of a child, a terminal illness or life-changing disability.

As a keen private pilot I became involved in supporting the charity several years ago and last year took the plunge to volunteer. I soon discovered why the enthusiastic Fly2Help team call these events Air Smiles Days. The most recent was held at Bristol Airport on April 22nd. Built around a flight experience in a light aircraft or helicopter, they are respite days for children and adults living with profound disabilities, life-limiting conditions, severe illness, bereavement and isolation. The difference they make to people's lives is breathtaking. Beneficiaries literally leave their worries on the ground and go home with lasting memories of a wonderfully happy day out.

I will never forget the beaming face of one young beneficiary who, born with a malformed left arm, clearly never believed aviation was something for him. Arriving at our Air Smiles Day with his mother and younger brother at the Airbus factory in Broughton, North Wales, this lad looked downtrodden and depressed.

When he walked out of the gate hours later he had a spring in his step, having experienced his first light aircraft flight, met people with similar disabilities to his own – and who had encouraged him not to see this a barrier in life – and even been introduced to some Airbus graduates and apprentices. It was clear that aviation had put a smile back on his face and a new fire in his belly to pursue his dreams. He also won a fiercely competitive paper aeroplane competition!

Edwin Brenninkmeyer, a Fly2Help volunteer pilot and CEO of Oriens Aviation, says: "Every pilot knows how empowering the gift of flight is: to be able to soar above the earth and watch the ground below shrinking ever smaller as the aircraft climbs and with it, all one's earthly problems, really puts one's own life in perspective. As pilots, we all know that feeling and how empowering it has been for us in our lives. But more rewarding by far than any of that, is being able to share that wonder of flight with others and especially those for whom life is particularly challenging and who may never have thought they would ever get a chance to experience flight.

Please could I encourage everyone to



donate time for Fly2help – it really is the most rewarding flying one can possibly do – to put smiles on other people's faces and give them that once-in-a-lifetime, enjoyable experience that they will never forget."

His views are echoed by Mark Farmer, a private aircraft owner who also donates flights to Fly2Help. Farmer, who flew the young boy during the Air Smiles Day I attended, says "Every time I fly a Fly2help mission, the looks on the faces of the beneficiaries remind me of the excitement of my first ever flight. The joy that it brings to the kids and their parents makes it all worthwhile."

Besides its Air Smiles Days, Fly2Help also runs an education programme that helps young people learn about the world of aviation and gain confidence and belief in themselves. The charity organises free-to-join scholarship weeks based at Biggin Hill, Gloucestershire, Luton and Oxford airports for groups of ten young people aged 14-18, each of whom will have won their place through an open application and interview process.

Here they learn about the breadth of career opportunities in the aviation industry and what skills and attributes they would need to find a place and how their career might develop. They see behind the scenes at the host airports, visit people in operations, air traffic control, engineering and learn skills such as marshalling and the understanding weather reports.

Some get to spend two days out visiting world-leading companies such as Airbus, easyJet and Rolls-Royce, and military

bases. They may even get a chance to pilot a flight simulator or take the controls of a light aircraft for a trial flight. The finale is a presentation ceremony attended by their parents and teachers.

In 2016 Priyanka Gandhi was an Aim High scholar at Oxford Airport. Coming from an aviation-minded family, none of her relatives has ever worked in the sector and she wanted to become the first. During her week she enjoyed visits to Airbus Helicopters, Rolls-Royce, Gama Aviation and CAE Oxford Aviation Academy, as well as RAF Brize Norton. She said the scholarship gave her the chance to meet people with first-hand experience of aviation and has set her up nicely for her future. "I now have the knowledge to work towards my goal," she added. Priyanka is aiming to begin her flight training this summer and pursue her dream of a career as an airline pilot.

Another Aim High student was first exposed to aviation having won an aerobatic flight with Fly2Help founder Phill O'Dell. After this experience he fell in love with aviation and studied hard, gaining a place at CAE Oxford to begin his airline pilot training, and today is a pilot for Monarch Airlines.

None of this could be possible without the phenomenal staff and volunteers who make Fly2Help the charity it is today. But it is always crying out for more, larger aircraft, volunteer pilots to donate flights, and people to help out on the ground, as well as donations to fund Air Smiles Days and Aim High Scholarships.

The Honourable Company of Air Pilots is rightly renowned for its charitable works. But could 2017 also be the year our members get more involved in Fly2Help? All of us can feel good about using our passions for aviation to help people less fortunate than us.

How to get involved

Fly2Help is always looking for new people to get involved in its work. Have you got what it takes to help?

Pilots – If you have access to an aircraft with 4+ seats, could you donate flights? Just one trip for a family would make a difference. The charity is also keen to find more helicopter pilots willing to donate flights.

Volunteers – Could you donate some time, either to host an Air Smiles Day or during an Aim High Scholarship? Are you a keen photographer or looking for a charity to support for your next fundraising adventure?

Fundraising – it costs around £25,000 a year to run Air Smiles Days and Aim High at Fly2Help's home airfields at Gloucestershire and Cotswold Airports, £2,000 per airfield at other sites we currently operate from and £2,500 to set up at a new location. Give what you can to make a difference.

You can find out more at: <http://fly2help.org/>

Company Visit to R.A.F. Cosford

By Freeman Jeff Cleary

We were greeted by Darren Priday, the Conservation Manager for the RAF Museums. He made us welcome, and showed us to the Michael Beetham Conservation Centre, a hangar to the rear of the museum site.

Once inside we were greeted by a multitude of airframes and artefacts in different states of renovation. The first talk was all about their Handley Page Hampden, P1344. The aircraft crashed in the Kola Peninsula, Northern Russia, in September 1942. It lay there in the Arctic Circle for 50 years, before being recovered to the UK; the museum took ownership in 1992.

Darren explained the work they carry out, and their main objective being to ensure that the aircraft are available to tell



Members listening to Darren explaining the history of the crew and airframe

The narrow fuselage of the Hampden evident here



The beauty of the Wellington's geodetic construction

the RAF's story to future generations.

Next on the tour was the venerable Vickers Wellington Mk10. Once the RAF's principal bomber, with over 11400 manufactured, now only 2 survive. (The other is at Brooklands, where there will be a Company visit in June). With its famous geodetic construction, Darren explained how much damage the Wellington could sustain and still bring her crews home.

The Wellington has been cleaned up and is due to be covered in new Irish Linen.



It is going to be painted in Bomber Command colours, but with no squadron markings so it can represent all. With the horrific losses sustained by Bomber Command, it's easy to understand why the Hampden and Wellington are so important for the RAF Museum.

Darren was also very proud that they run engineering apprenticeships, and have won national awards for doing so. With a total staff of 20, and Darren's 26 years RAF engineering service before joining the museum, the standard of conservation is second to none. Everything is carefully researched, using old original drawings, and of course they have access to MOD archives. Parts can be rare, but they try and acquire whatever is needed, or if necessary they can in some circumstances swap parts of the museum's collection, be that an artefact or even an airframe. Apparently, Spitfires are really good 'currency'!!! It goes without saying the range of skills and materials that are employed is very impressive.

We then moved on to a beautiful German LVG C6, a WW1 artillery spotter plane. This is in deep restoration, and they are presently researching the original German 'lozenge' camouflage. There are only 3 surviving examples,



The unusual lozenge camouflage of the LVG

with the Brussels Air Museum and the Musée de L'Air in Paris having the others.

The last item shown to us is probably publicly the best known of all their current work – the Dornier Do17 which was recovered from the Goodwin Sands in 2013.

It has been identified as 5K + AR , which was shot down on Monday 26th August 1940, whilst operating from St Trond in Belgium. Although credited to a Defiant from 264 Squadron, the museum found a considerable amount of shrapnel damage, implying damage

caused by ground fire, so it was probably 'finished off' by the Defiant.

Immediately on being raised from the seabed, she was placed in a purpose built hydration tunnel, and sprayed with low concentration citric acid to arrest the damaging effects of salt water immersion. The intention is to display it as found on the seabed, and no restoration or improvements made. The parts will be cleaned, catalogued and then finally displayed in Hendon. It will be the only Do17 left in the world.

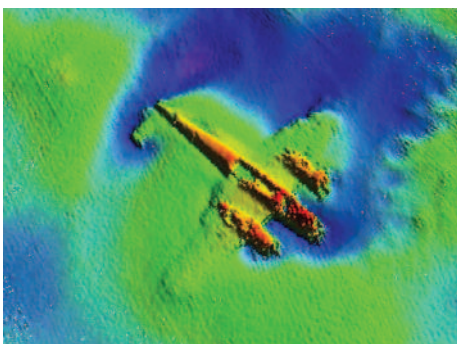
The final Hangar we visited was Test Flight, which contained some odd

experimental aircraft. The famous TSR2 , Kestrel FGA1 along with historic names as Short Brothers, Saunders Row and Fairey. A particularly odd looking aircraft was the Gloster Meteor F8 altered to test the possible advantages of flying from a prone position.



Darren inside the wreckage

Seabed Sonar scan



The ungainly prone Meteor

Duke of Edinburgh's Award Scheme 2017

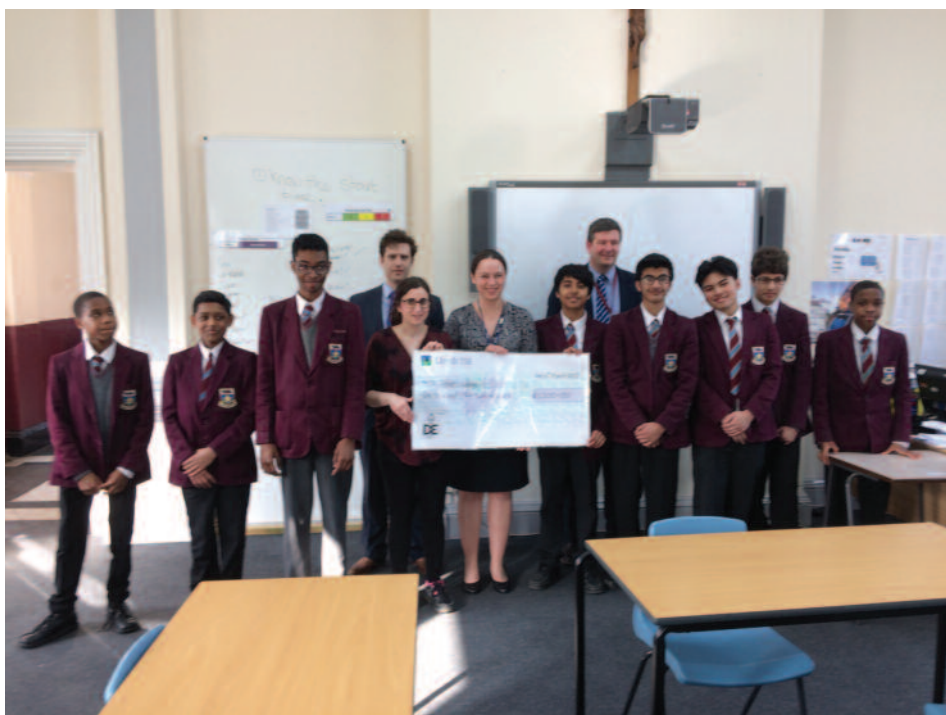
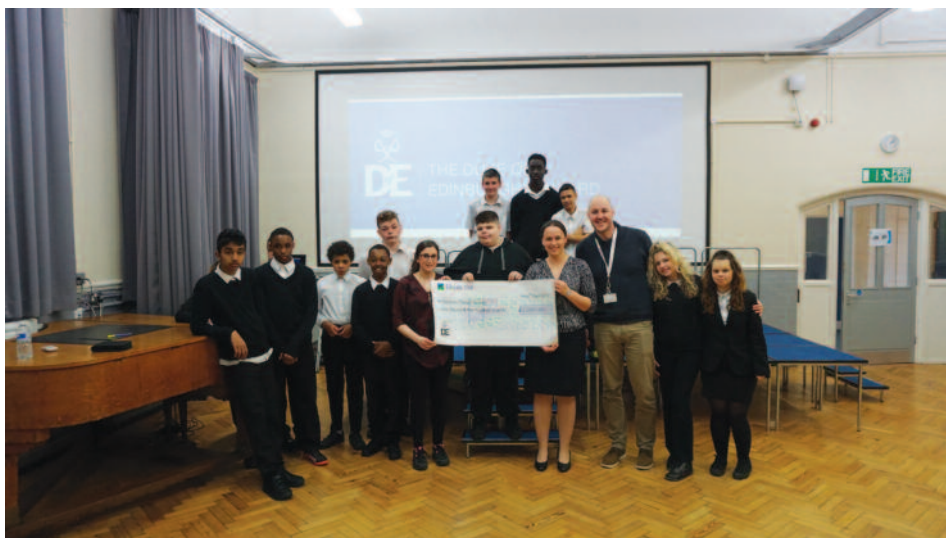
By Associate Zoë Gell

Every year since 2000, the Livery Companies Golf Day has raised funds to be donated to the Duke of Edinburgh's Award Scheme. The Golf Day culminates in the award of the Ray Jeffs Cup. This year's match is due to be held on the 27th July. Ms. Hayley Hyman, the D of E Operations Officer, identifies schools whose financial resources are limited to such a degree that involvement in the scheme would not be possible without assistance. Each year, three schools are selected to receive an award of £1200 each to kick-start their involvement with D of E, and members of the Air Pilots Livery Schools Link (LSL) team are invited to make the presentations.

The first school selected for funding during 2017 was Bensham Manor School, a heavily oversubscribed secondary special school in Thornton Heath, Croydon, which caters for students with a wide range of special needs. The students come from across Croydon and occasionally from neighbouring authorities if their specific Special Educational Needs cannot be met elsewhere. Bensham Manor are delivering the D of E scheme to every student from Year 9 upwards (100 young people with Special Educational Needs). The second school selected for funding was St. Joseph's College, Croydon, which delivers D of E to any young person wishing to take part. They plan to grow their scheme to deliver all three levels (Bronze, Silver and Gold) over the next few years. Both Bensham Manor and St Joseph's College are in a very deprived area of Croydon with high numbers of pupils receiving free school meals. The presentation of the funds was made on 16th March 2017 by Associate Zoë Gell and Hayley Hyman.

Normally, there are three awards each year; however, a school previously selected for funding has been unable to take part in the scheme and duly returned their cheque. These funds will be re-allocated during 2017. Hayley Hyman is currently reviewing the

applications and will select the third and fourth schools to receive funding over the next few weeks. The presentations will be made by Hayley and a member of the Air Pilots Livery Schools Link team.



Company Visit to Hybrid Air Vehicles, Cardington, 6th April

By Liveryman Tom Eeles

Our excellent visits organiser, Liveryman David Curgenven, arranged another visit to see the Airlander 10 at Hybrid Air Vehicles base at Cardington on 6 April. Those who attended last year's Tymms Lecture may recall the fascinating presentation on the Airlander, which followed close on the heels of the much-publicised media reports of the craft's heavy landing after its second flight which resulted in damage to the flight deck module. Hybrid Air Vehicles have had a busy winter repairing the damage and modifying the vehicle in the light of the experience gained on that second flight.

Airlander emerges from its historic lair



Seventeen Company members arrived at Cardington on a fine sunny Spring morning. We gathered outside the airship hangar used by HAV, which dates from the Twenties and the age of the rigid airship. The scale of this building cannot fail to impress, as indeed does the bulk of the Airlander itself, which was obvious the moment we were led inside.

Our guide for the tour of the Airlander was Henry Williams, who bombarded us with a mass of facts and figures as we walked around the enormous aircraft. Previous visits by the Company to Hybrid Air Vehicles have been reported in Air Pilot so rather than repeat all the statistics I will merely give a short summary. The Airlander 10 is 92m/302ft long, 43.5m/143ft wide and 26m/85ft high, making it the largest aircraft in the world. The hull's aerodynamic shape provides 40% of the vehicle's lift. Four 325HP 4 litre V8 direct injection turbocharged engines, fuelled by Jet A-1, power Airlander. All four engines are configured in ducts with blown valves to allow vectored thrust for take off, landing and ground handling. The flight deck has one pilot station; a cabin for passengers or payload can be fitted; the mid-body can



be used for a centerline payload beam for external loads or a cabin extension; the aft-body contains fuel tanks and additional payload space.

The following aircraft enhancements have been incorporated as a consequence of lessons learnt after the heavy landing last year. A new Auxiliary Landing System (ALS) has been added which allows the aircraft to land safely at a greater range of landing angles. This is a pilot-deployable two airbag landing system, looking rather like a pair of elephant's legs, which the pilot can deploy as an extra cushion on which to land. The airbags are over 3 metres in length and contain 15 cubic metres of gas, less than 0.1% of the entire hull volume.

An airbag has been fitted on each side of the Flight Deck, offering enhanced protection to the cabin as well. It will be deployed on most landings during the flight test programme. It uses the existing ballonnet fans to inflate – which takes under 20 seconds. Finally, another major accomplishment is the commissioning of the Mobile Mooring Mast (MMM). The MMM is an integrated tracked vehicle and mooring mast, which makes it much easier to control and ‘push back’ the Airlander when manoeuvring it around an airfield. It has a single pivot interface

with the Airlander, providing a much simpler mechanism than was used previously. All these pieces of equipment are new to Airlander, and have been developed as a direct result of the team's experience since the flight tests last August. They will make the Airlander easier to manoeuvre and safer to land. All these modifications were visible during our walk around the Airlander. At the end of the visit Simon Davis, the Airlander Chief Test Pilot, joined us for a few minutes. Simon was an undergraduate member of Cambridge

University Air Squadron when I was an instructor on the squadron, so it was very gratifying to see him in this important and prestigious appointment. He told us that flight trials were about to start again very soon; media coverage on TV some 4 days later showed Airlander outside and attached to its MMM, ready for flight. Doubtless flight trials will have started by the time this report appears in Air Pilot.

Following the visit the party moved to a local hostelry in Cardington village, which provided an excellent lunch in convivial surroundings. Many thanks go to Liveryman David Curgenven for organizing this fascinating visit, and to Hybrid Air Vehicles for hosting us. The Company wishes Hybrid Air Vehicles every success in this new venture.



The new 'feet'

Space Invaders

By the Editor

Economists (full disclosure – once upon a time, so long ago that economists still had a vestige of public acceptability, I studied economics) have this concept of a ‘free good’. This is something that is available at no cost to society. Air is a classic example. However we pilots have long known that airspace is very different from air: it is increasingly obvious that airspace is a finite resource. We, or rather our regulators, have devoted increasing resources to managing its use.

But we – pilots, the traditional users of airspace – have now to acknowledge that there are new boys on the block, who do not seem to want to play by our rules. The development, and now mass consumer adoption, of drones is the first evidence of this. Amazon has been a well-publicised advocate of delivery to individual households by drone. Whilst there has been a degree of scare-mongering about this, and no doubt reality lags plans, it is of note that the global tech giant (market capitalisation \$343bn) filed in February a patent to drop packages by parachute to households from drones. The parachute apparatus would be controllable by the drone to ensure wind gusts, etc, would not deter the package from reaching its destination.

In April, Uber, that minicab firm so beloved of Millennials, announced it would be trialling an aerial taxi service

KittyHawk's recreational vehicle



The eHang 184

(in Dallas and Dubai) in 2020. Their thinking is straightforward: “urban air transportation will use three-dimensional airspace to alleviate transportation congestion on the ground. A network of small, electric VTOL aircraft will enable rapid, reliable transportation between suburbs and cities and, ultimately, within cities.” Uber have partnered with a company better known to some existing pilots, Pipistrel, the Slovenian aircraft manufacturer that is evolving from LSAs to heavier craft.

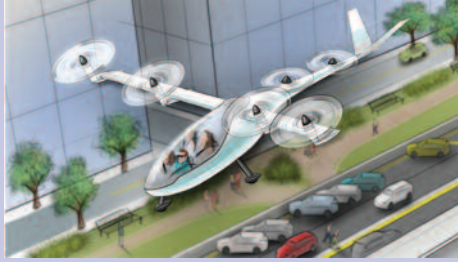
Also in April, a company backed by Google’s Larry Page, announced a personal flying vehicle (that would be classified as an Ultralight under the FAA regulations). See www.kittyhawk.aero. This means it would not need to be registered, and the owner would not need a pilot’s licence. The marketing bumf gives an idea of its consumer positioning: “When we set out to build the Flyer, we wanted to engineer a personal aircraft that’s easy to fly and accessible for all. We imagined simple controls and advanced electronic capabilities so that you could learn to fly it safely in minutes. We also wanted it to be 100% electric, and take off and land vertically. The Flyer would be so compact that it could fit comfortably in a garage.” The company promises the product, powered by eight electric rotors, will be available by the end of this year, at a price yet to be disclosed. As it can only (legally) be flown in uncongested areas and over fresh water, its uses would appear limited

to recreation. However given Larry Page has a net worth reputed to be \$45bn, it is quite possible that development of more ambitious machines would be well funded and rapid.

Nearer our doorstep is the European venture, Lilium. Founded in Munich in 2015, it raised €10m in London last December. It claims its machine “enables you to travel 5 times faster than a car by introducing the world’s first all-electric vertical take-off and landing jet: an air taxi for up to 5 people.” Propulsion is electric rather than Jet A1. “It’s our mission to make air taxis available to everyone and as affordable as riding a car.” The CEO says “We want to democratise clean aerial on-demand transportation.” See www.lilium.com. It made its first flight (including a hover/straight flight transition) in April.

Whilst it is atypical for the Chinese to make technological progress in-step with Western rivals, they appear to be doing so in this field. The eHang 184 is an “autonomous aerial vehicle” – catchy?! It is “the safest, Smartest and Eco-Friendly low altitude autonomous aerial vehicle, aiming on providing Medium-Short Distance communication and transportation solution.” (sic) Again it is electric-powered, and appears to be intended to be fully automatic, with the user merely inputting his desired destination.

Clearly the driver for much of this development is urban congestion. The Silicon Valley companies know this to



Uber's Elevate



Lilium's plethora of electric motors

Lilium city airport concept



their cost (an hour and a half to commute there from San Francisco). So the stimulus is the massive congestion of West Coast consumer routes in a society wedded to personal transportation (i.e. currently cars), and with poor public transport systems. Uber reckons that the average SF resident spends 230 hours p.a. commuting by road – only an hour or so a day. But they also estimate the average commute in Mumbai is 90 minutes – they are looking to market on a global scale (and presumably are aware of the state of the M25 in rush hour....).

Lest you think the field is only full of new tech companies, Airbus has an advanced special projects division (A³) located in Silicon Valley. Its Project Vahana (where do these names come from?) is “a self-piloted flying vehicle platform for individual passenger and cargo transport.” The first flight of the prototype is scheduled for late this year. In tandem Airbus is attempting to mould the regulatory environment to suit such vehicles with its Skyways project. It has started a pilot (or should that be pilotless) for package deliveries on the campus of the National University of Singapore.

Additionally it is working on a multi-passenger carrying urban helicopter design which would evolve into a pilotless model.

Whilst we can expect Airbus to be fully cognisant of the complexities of airspace management and pilot licencing, a pragmatist would be much more cautious about the other companies mentioned above. Their current outpourings suggest they see airspace as a free good. The tech giants have achieved their present success in large part because they are disrupters of the status quo. We have seen the attitude of the likes of Amazon, Google, Facebook and Twitter in fields such as personal data security, facilitation of child abuse and terrorism, and so on – it verges on arrogance. Their extreme financial valuations are not good for the humility of their executive boards – the valuation of the privately held Uber is broadly the same as that of Airbus Industries! These tech companies have fearsome lobbying power. The main brake to the speed of development of many of the projects I have noted will no doubt be the rate of improvement of battery efficiency.

But when the battery equation reaches

tipping point the volume of new airspace users could grow very rapidly. The business case for Uber, in particular, looks compelling on the basis of scale. Uber's chief product officer, Jeff Holden, has been reported as saying that [achieving a cost per passenger seat mile] equivalent to today's car-borne tariff of \$1.32 is “possible because we are radically changing the type of aircraft we are talking about here and are doing it at mass scale. This is why Uber is running at this, as opposed to taking a careful, slow approach. We are talking about volumes of production that go way beyond what aviation has ever done.”

The international piloting community should therefore, in my opinion, get its towels on the sun loungers now. It needs to ensure that the potentially explosive growth in aerial vehicles that are either unmanned, or piloted by unqualified personnel, is contained in narrow airspace that does not conflict with existing commercial air transport needs. And GA needs protection too, although that will no doubt prove a problem too far.

VC10: Icon of the Skies

BOAC, Boeing and a Jet Age Battle

Lance Cole, Pen and Sword, 2017

Review by the Editor

As a good few of the older generation of Company members may have many hours on the type, I thought a review of this recently published volume might be of interest.

As the opening line of the introduction states: "This is the story of not just an airliner, but also the airline industry, an airline and the nation and society it served." The author thereby gives himself authority to swerve off piste – which he does! Lance Cole is undoubtedly in love with this aircraft – indubitably the Queen of the Skies during its reign; he sets out well its historic context – the old Imperial Airways seaplane routes down Africa. This slightly lyrical start made me think the book would not be one of those more technical tomes where the history of stress testing the port inner flap bracket is set out in detail. I was wrong – this book is comprehensive, and the reader is reminded not once, twice or thrice, but many times over that this machine was true to the ancestry of Vickers as a shipbuilder. We learn just how many how items in the final design were milled from solid billets.

The VC10 emerged from that strange post-war period when the Jet Age was bleeding edge, when customer reaction to new aircraft types could only be guessed at, and when the scale of growth in commercial traffic was unknown. Cole writes with a very acid pen about the political decisions taken in the Forties and Fifties which shaped the industry, and concludes that the Comet was an evolutionary dead-end. He gives full credit to the German designers lifted from their Motherland in 1945, whose IP enhanced the subsequent products of both the USA and the UK.

The V1000 (an immediate forebear of the Valiant) is described, as many of its design features evolved into the VC10. He relates it as being of typical Vickers strength, yet does not explain why it subsequently had such major metal fatigue issues that it was withdrawn from service.

His love of the subject occasionally leads

to some rather unsubstantiated (and in this case tautological) assertions: "The twin and tri-jet Vanjet concepts had the air of real, tangible success." Cole shares Vickers' pain that BOAC proved such a troublesome customer, and he keeps returning to the subject of the national airline's continuous love affair with Boeing products, even to the extent that BOAC continued placing orders (for the 747) even whilst it was engaged in a lengthy and acrimonious law suit about an alleged B707 design flaw (after a CAT-induced crash in Japan). The book includes a thorough comparison of the VC10's operating merits compared to those of the 707.

Younger readers may be surprised to learn that BOAC demanded (and won) an operating subsidy for flying the VC10. The underlying problem was that the VC10 was designed and engineered to operate from short and dubious runways in Africa. Boeing's pressure, and the USA's financial muscle, meant that by the time the VC10 was in its heyday, runways at major international airports had been extended to accommodate the less than sprightly 707. The VC10's key operating advantage was negated. What was left was an airframe that was as delightful to fly, as it was as comfortable in which to be a passenger. Sadly I never flew in a BOAC example, but did have the opportunity to fly on a couple of Guild visits in a 101 Squadron tanker – Company members who missed out on those trips should regret it for the rest of their time on earth (or in the air)! It was a privilege to watch two skilled RAF pilots 'jousting' with a sister ship, and surprising on first sight to witness what good physical exercise it was, wrestling the old but sporty lady around the skies.

This book could have usefully been 30–50% shorter. A discourse on interwar UK airlines and airports around London adds little to the narrative, for example. There is frequent repetition and duplication; the narrative flow goes round in circles. It is obviously that Cole knows his topic very well, but it is as if he has failed to think through his prose before starting to tap



The Queen of the Skies strutting her stuff at the RAF Brize Norton Families Day 2010



his keyboard. The quality of English deteriorates towards the end of the book. Take a peek at this mind-bender:

"BOAC's cancelled Super VC10 orders meant that the RAF could jump in and get quicker VC10 C Mk 1 built slots of its Type 1106 airframes and the first RAF VC10 registered as XR806 took off from Brooklands on 26 November 1965, entering service with the reformed No. 10 Squadron in July of 1966, but not performing its first full RAF 'airline' Transport Command duties until early 1967 after months of crew training and route proving all over the world – where on occasion, local BOAC VC10 knowledge came to assist." Phew!

Apostrophes wander or are absent, and there is a rash of errors that decent editing should have excised. An egregious error is that Vickers' test airfield is usually called "Wiseley"! Cole is very comfortable with the BOAC/Vickers relationship, but comparatively little space is given to the RAF's procurement exercise.

Aside from some quotes from Brian Trubshaw (the Vickers / BAC test pilot), there are few quotes from VC10 pilots – this is a glaring omission. Pen & Sword should have taken some lessons from Grub Street's 'Boys' series, and utilised the power of selective quotes from aircrew. There must be a plethora of down route anecdotes, which would have enlivened this volume. Former VC10 aircrew will no doubt find much of interest in this book, but it is too flawed for the general reader.

Eat your heart out London - Go Hong Kong!

By **Upper Freeman Henry Chan** and **Warden Colin Cox**

For almost fifty years it has been recognised that airport capacity in the South-East of the UK would need to be increased. From the shelved Maplin Sands project to Boris Island, it might reasonably have been thought that the matter would have been decided with the publication of the Airports Commission report recommending the expansion of Heathrow by building a third runway. This recommendation was endorsed by the UK Government as recently as October 2016 but the next move is yet to materialise and is eagerly awaited.

Meanwhile on the other side of the globe.....

The Three Runway System (3RS) proposed by the Hong Kong Airport Authority (HKAA), originating in the Master Plan 2030, is the result of a National Air Traffic Services (NATS) commissioned traffic forecast, that the current two runway system will reach its maximum capacity between 2019 and 2022. The project will cost HK\$130 billion (£13 billion), and is said to take less than 10 years to complete. Many will remember the unique challenges afforded by the old Kai Tak Airport at its city centre location, with its tight right turn over a densely populated area on short final. With a requirement for a completely new airport, the original project to replace Kai Tak with the new facility at Chep Lap Kok took little more than 10 years from inception to completion.

The new CLK International Airport (HKIA), located to the north of Lantau Island, does though also provide its own unique challenges. Considering its proximity to the Lantau Hills, gusting southerly winds, particularly during the summer typhoon season, can give rise to frequent windshear events that affect the parallel runways with their 07/25 orientation.

Surrounded by nearby terrain, there are limited corridors in which departing and arriving traffic can manoeuvre. Given this terrain, which restricts departure and missed approach routings, and given the



Chek Lap Kok in its current state

traffic mix at HKIA, NATS determined that with either Segregated Mode (one runway for departure and one runway for arrival), or Parallel Mode (both runways for arrival and departure) operation, the maximum capacity is 68 Air Traffic Movements (ATMs) per hour. This is well short of the theoretical capacity of 88 ATMs (44 ATMs for each runway in parallel mode).

To cater for predicted growth, the only solution was that a third runway would be required that would provide up to 102 ATMs per hour in independent mode operation.

The proposed 3RS includes a new runway to the north of the existing airfield built on reclaimed land. With a lateral spacing of at least 1525m it enables fully independent operation of all runways, aided by a new taxiway system that skirts around the existing north runway to enable efficient runway crossing. It also consists of a new terminal, aircraft maintenance area and associated supporting area.

The required land area of 650 hectares will be reclaimed from the sea to the north of the existing airfield. New technologies are being employed for the reclamation to minimise environmental impact to marine life nearby; the Chinese White Dolphin habitat, in particular, is very sensitive. There are also underwater

contaminated mud pits.

Planned expansion of HKIA has not come without its opposition however. Mainland controlled airspace immediately to the north, and three other adjacent airports (Macau, Shenzhen and Zhuhai), seriously hamper the ability of procedure designers to unleash the full potential of the 3RS. Thus, it is feared by many that the project will be a waste of taxpayers' money, and create a white elephant that cannot yield any extra capacity.

Environmentalists are also against the project with the fear, in particular, that the aforementioned habitat of the Chinese White Dolphin will be destroyed. They argue that the proposed mitigation measures are not sufficient and a judicial review is underway to revoke the environment permit issued for construction.

All that said, extensive public consultation has paved the way for the project to move forward, and the 3RS will allow HKIA to handle future traffic demand, as estimated by IATA Consulting, of 102 million passengers, 8.9 million tonnes of cargo and 607,000 aircraft movements per year by 2030.

Will London's Heathrow Airport have a third runway by then?

Back to (Imperial) College

By Liveryman David Hyde

A group of 30 members and guests were treated to a memorable "tour de force" at the Department of Aeronautics of Imperial College in London on 25 April. We were left in no doubt that Imperial was maintaining its reputation of being a world class research and teaching establishment. Growth of about 40% during the last five years confirmed that momentum was being maintained despite concurrently moving the whole Department to a new site on the opposite side of Exhibition Road in South Kensington. The numbers were impressive: 30 academic staff (half in aerodynamics and half in aerostructures), 110 PhD students, 120 MSc students and 450 undergraduates, supported by 12 technicians and 10 administrators.

Aeronautics has been taught at Imperial since 1909. Six of our visiting group, which included our Master, were alumni of the Department and the earliest attendees were found to be your correspondent and his guest, who formed part of the 1954 intake. Today, energy and creativity were palpable as we moved around the campus and our guides were universally enthusiastic and most certainly on top of their game. The integration of safety as a primary consideration in all equipment design was impressive. Perhaps the only uncertainty we could detect was how BREXIT might affect the revenue stream to the Department as it is more heavily dependent on research grants anchored in the EU, than other departments at the University.

Automobile development activity can be

traced back to the Donald Campbell era and many of the innovations in Formula One racing cars have been initiated in Imperial's low speed wind tunnels. Consequently, it was no surprise to find one branded as the "Honda Wind Tunnel". But an array of low speed tunnels, backed up by a water tunnel with a flexible 9 metre working section, which enabled high Reynolds number flows to be simulated at relatively low speeds, enabled a very wide range of research activity to be pursued. This ranges from big issues such as oil rig structures to the details of the airflow behind F1 racing wheels. Moving up the speed scale, examples of gas guns and hypersonic tunnels provided the opportunity to study problems such as spacecraft geometry on re-entry. Typical run times are 10 milliseconds with stable conditions being restricted to 3 milliseconds – quite a measurement challenge.

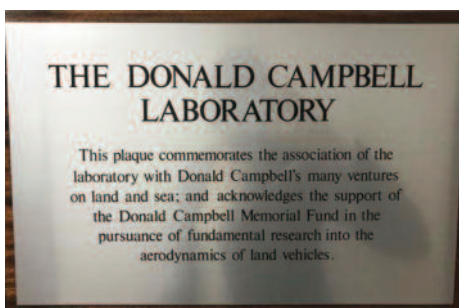
The Imperial College Flight Simulator is fully flexible and can be configured as a light aircraft, an airliner or even a spacecraft. It has a side stick as well as a conventional yoke. Half a dozen "volunteers" from our numbers chose to fly it in the B777 mode. However, the significant new area of work focusses on drones, the existing "flight zone" having a complex array of 16 cameras and autonomous control to examine applications such as the building of structures in non-accessible areas. And a new Flight Arena for drones will be opened later this year, as this activity continues to develop rapidly.

On the aerostructures side of the business we visited the Structures Laboratory, shared with the Mechanical Engineers, and were shown the range of DFF (Dynamic Fracture and Forming) work which included fatigue machines, a drop tower for impact testing and a press which was currently occupied by composite panels from Airbus. The Composites Laboratory concentrated on

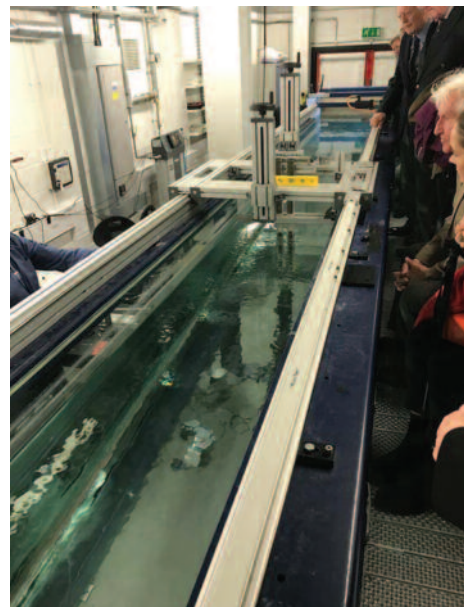
the manufacture of composites by the application of heat and pressure on basic fibre laminates. Devices such as water jet cutters, freezers, layup tables and vacuum tables facilitated the production of both simple and complex components.

After a break for lunch, we were treated to an explanation of the role of the Centre for Blast Injury Studies by its Director, Professor Anthony Bull. The core funder is the Royal British Legion, and professional military personnel enable this newly created body to pioneer the science and engineering of blast injuries. As Prof. Bull demonstrated to us, whether we like it or not, explosions are very much on the increase in today's world. This is ground breaking work in both the military and civilian spheres, involving the confluence of engineering, science and medicine. The Centre's work can be seen in a myriad of ways: changes to vehicle specifications, as well as in the design of boots, helmets and mats for military applications. And it was good to learn that Trauma Care had been significantly improved in the UK's major hospitals in recent years. We were then shown the Traumatic Injury Simulator where variations in posture and different levels of hand, head and feet protection could be simulated in order to

Plaque displayed in the Donald Campbell Laboratory



The water tunnel



maximise the mitigation of injury. And, finally, a shock tube, rigged to simulate injuries due to blast waves, was used to simulate IED components and fragmentation penetration. It was moving to have this last device explained by Thuy-Tien Nguyen, a Research

Associate from Vietnam who had originally trained as a physicist and had been working at Imperial for the last seven years.

Our thanks, once again, to David Curgenvin for making the arrangements for this excellent visit.



The traumatic injury simulator

The hypersonic gun tunnel

Luncheon Club - 26th April

A Polish Pilot flying and fighting in WW2

By the Editor

This was an historic occasion – the first under the gavel of Past Master Chris Ford, who had just taken over the reins of our prestigious luncheon club from John Robinson. There must have been a rush of blood to Fordy's head as he called the lunch to order – there was such a vigorous bang of the gavel, that his wine glass shattered. Much mirth – particularly from JBR! With exquisite timing, our speaker was invited to the lectern just as the RAF Club's rebuilding programme started up after its lunchtime hiatus. This may have made the contents a little difficult to discern for those hard of hearing, or those in the slightly cheaper seats of the club's ballroom.

Our speaker was Liveryman Captain Arthur Creighton, his subject his father-

in-law – Flt. Lt. Antoni Michal Kalubinski. Arthur had first met his wife in 1964, and found that his batman whilst he was Director of Staff at the College of Air Warfare at Manby had batted for her father in years past. Born in June 1916, Antoni had fled Rumania in 1939, and arrived in Marseilles that November, whence he made his way to Great Britain. There were too many Polish volunteers to fill the pure Polish squadrons in the quickly-expanding RAF, so the surplus was farmed out. He flew his first tour on Hurricanes with 32 Sqn at Pembrey in 1944. Having had possession of Antoni's log book, Arthur ran through Antoni's intensive flying in 1944-5, which went on to include 'Ranger' missions over Northern France. One such flight, a week after D Day, was

described as 'Escort to VIP', and Arthur conjectured that this might have been de Gaulle or Montgomery, both of whom were flown over the Channel that day.

He also served with 303, 308 and 66 Squadrons, the latter on Spitfires, and Arthur showed atmospheric shots of Spits on the newly created (and dusty) strips in Normandy. Whilst he ended up with only 1 1/2 'kills', Antoni did have the honour of being the last Pole to shoot down a Luftwaffe aircraft whilst not in a Polish squadron. He was a chum of Johnny Kent (a colleague on 303 Sqn), and Arthur recommended highly the book recently published by Kent's daughter, Alexandra, *One of the Few*.

Antoni left the UK in 1947 and formed a new family in Canada. He ended up in California, where he died in 1986. Arthur gave us a useful insight into a corner of the RAF's WW2 history sometimes overlooked.