



# THE HAWKER ASSOCIATION

NEWSLETTER 51 - SUMMER 2018

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## EDITORIAL

How sad it is to have to record the death of John Farley. There is a short appreciation of him below but many of you will have personal memories to cherish.

Please read the item on the General Data Protection Regulations (GDPR) and act on the request therein.

As usual, you can read reports of excellent talks given to the Association, this time by Chris Roberts and Dick Poole; when you fly off on holiday, take the safety advice given by Chris.

Send your **contributions** to The Editor, Chris Farara, 24 Guilddown Road, Guildford, Surrey, GU2 4EN or e-mail to [cjfarara@ntlworld.com](mailto:cjfarara@ntlworld.com). Tel 01483 825955.

Some 78 Members have still to pay this year's **subscription**; your names are in **bold** on the back page. Several still owe for last year; see the back page of Newsletter No. 50.

Send any **membership** correspondence to The Secretary, Barry Pegram, 12 Becket Wood, Newdigate, Surrey, RH5 5AQ or e-mail [barryvpegram@aol.com](mailto:barryvpegram@aol.com). Tel 01306 631125

## PROGRAMME

Wednesday 11<sup>th</sup> July

“Ernest Hemingway Visits Dunsfold, D-Day and Divorce” - **Dick Wise**

Wednesday 8<sup>th</sup> August

Social with videos.

Wednesday 26<sup>th</sup> September

Outing to **Harrier Heritage Centre**, RAF Wittering.

Wednesday 12<sup>th</sup> September

Social with contributions on Members' interests.

Wednesday 10<sup>th</sup> October

Title tbd - **Lt Cdr Chris Goetke**.

Wednesday 14<sup>th</sup> November

“The Aviation Industry in Surrey in the Great War” - **David Hassard**.

Wednesday 12 December

**Christmas Lunch**

**Dick Wise** was an avionics engineer and Director Harrier and Lt Cdr **Chris Goetke** is the CO of the RN Historic Flight. If you have a suggestion for the **12<sup>th</sup> September Social** please let the Editor know.

**Harrier Heritage Centre**. Up to thirty Members are invited to RAF Wittering on Wednesday 26<sup>th</sup> September. There is a reservation fee of £10 per person for those wishing to go. Please send your cheque, payable to the The Hawker Association, to Frank Rainsborough at Chertsey Cottage, 8 Chertsey Road, Ashford Common, Middlesex, TW15 1SN. Cheques must be received by 8<sup>th</sup> August or handed in at the Association's meeting that day. The fee is non-refundable and will be donated to RAF Wittering's chosen charity. Entry is free. Please include your email address for Frank to use for sending information when it becomes available. Members are to use and possibly share their own transport to get there by about midday.

## JOHN FREDERICK FARLEY OBE, AFC, CEng, Hon DTech, Hon DEng - 1933 to 2018

Members will have heard the sad news that John Farley, our friend, colleague and test pilot, died peacefully on 13<sup>th</sup> June, aged 85.

John's career in aeronautics started when he became a student apprentice at the Royal Aircraft Establishment, Farnborough. On completion he joined the RAF flying Hunters with No.4 squadron and instructing at the Central Flying School.

After graduating from the Empire Test Pilots School and flying a wide variety of experimental aircraft in Aero Flight at the Royal Aircraft Establishment, Bedford, including the P.1127 and the Short SC1, John joined Hawker Siddeley at Dunsfold in 1967, becoming Deputy Chief Test Pilot in 1971 and Chief Test Pilot in 1978. He worked closely with the design organisation, in particular with John Fozard on the Sea Harrier. Retiring from test flying with British Aerospace on his 50<sup>th</sup> birthday in 1983, he became the Manager of Dunsfold Aerodrome where he was responsible for developing and modernising the facilities. He left British Aerospace in 1990 to be a freelance test pilot retiring from test flying in 1999.

A great proponent of engineering education John founded the Schools' Aerospace Challenge which developed to include the Aerospace Summer School at Cranfield University. He was elected President of the Association of Aerospace Universities in 2009 and received honorary doctorates in engineering and technology. In addition, numerous professional bodies including the Guild of Air Pilots and Navigators, the Royal Aeronautical Society, the Air League and the Institution of Mechanical Engineers, presented him with their most important medals and awards. John received a Queen's Commendation for Valuable Service in the Air in 1970 and was appointed OBE in 1980.

He was a frequent contributor to aviation journals and magazines and appeared in several TV programmes, usually featuring the Harrier. His remarkable autobiographical memoir, A View from the Hover – My Life in Aviation, was published in 2008. John was a keen supporter of the Hawker Association giving numerous talks, often at short notice, and writing articles for this Newsletter.

Those of us who were fortunate enough to have been associated with John professionally or socially will remember him as a likeable, softly spoken, clear thinking man with the gift of explaining complex matters to the layman as well as to colleagues. We will miss him and send our very best wishes to his widow Adele and his family.

## **ANNUAL GENERAL MEETING**

### **Chairman Chris Roberts's Report 2018** (shortened version)

The Hawker Association continues to thrive in our 15<sup>th</sup> year. This is my first report as Chairman and I therefore have the opportunity to comment on the Committee's work without being accused of claiming credit. It has been very interesting to see how hard the Committee works; a lot goes on behind the scenes to make the various activities happen throughout the year; what the Members see does not fully reflect the commitment and effort that is involved.

I will resist listing everything and everyone to avoid a long dissertation that risks upset by omission where the intent is to give credit. Nevertheless, I am going to thank Barry for his guidance during my first year. He suggested that I put my name forward, so it was only right that he should try to fulfil his assurance that being Chairman was straightforward. However, Barry you will need to keep trying! I will also comment on Chris Farara's achievement in putting together the 50<sup>th</sup> Newsletter. We must not underestimate the effort involved over 15 years. This large volume of material is the equivalent of a substantial book

Keeping the IT processes running is vital, and the modern world brings increasing problems for Richard Cannon. New internet security requirements have caused some website links to be rejected by Google; please do not consider these to be website failures. Our database and website need to be functional, up to date, robust and legal. That last point, legal, is proving a little difficult at present because new data protection laws (not designed for organisations like ours) come into play in May. We may need all Association Members to sign a new document to allow us to hold their information; please help us if we need another round of paperwork

I would also like to thank Sir Colin Chandler for giving us his support as President. Sir Colin is stepping down today after eight years in the role; the President's term should only be for 5 years. He has given the Association great support and has always been available to help and give advice.

One of the Committee's tasks is the selection of a new President, and it gives me great pleasure to announce that Colin Wilson has agreed to take up the position today. On behalf of the Committee and Members I thank Colin for accepting the invitation and for being so willing to become President. I am sure that most of you know Colin from the old days, but it may be appropriate to briefly outline his background for those who are not as familiar. His career spanned 42 years in British Aerospace and predecessor Companies, starting with Vickers-Armstrong in 1956. A 20 year period of direct involvement with V/STOL started at Dunsfold in 1966. Subsequently a variety of roles across the wider British Aerospace ranging from Naval and underwater systems to electronics, led to an appointment as MD of the stand-alone company BASE Ltd. He was President of British Aerospace Japan for 5 years, and was awarded an OBE in 1999.

With regards the role of the Committee, I emphasise that we are here to serve you, the Members. We are always willing to move the Association in any direction that would contribute to its continued success and further the interests of all Members. We are open to suggestions and ideas for new activities or links with other associations and organisations. We must not stand still, and being populated predominantly by an aged community we always need to be on the lookout for new Members. The application form is on the website; please spread the word. We have welcomed some new Members again this year including aviation minded folk who were not employed by the Company.

During 2017 the Association carried out further fund raising in support XP894, G-VTOL and other Hawker items at Brooklands. I am pleased to announce that we recently forwarded a cheque to the museum for £2000 which was very well received. Our gratitude goes to all Association Members who contributed

We have co-opted a new member onto the Committee. Paul Rash, an ex- Dunsfold Chief Flight Test Engineer, has joined us to increase our attention to Heritage Matters. Of course we also have David Hassard on the Committee and his day job is managing the Kingston Aviation Heritage Project, but the Association is looking at one or two things that will elevate our heritage awareness within the local community in parallel with David's activities. However, no long term commitments will be undertaken that might prove to be onerous for future Members of the Association. Funding would be on a stand-alone basis so that the Association membership subscriptions are not diverted into any new heritage activities.

### **Secretary's Report**

Barry Pegram reported on the general state of the Association. Current Membership was 357 including 51 ladies, 16 overseas and 23 'non Hawker' members. Sadly fifteen members had died since the last AGM: Bryan Austin, Keith Chapman, Ken Davies, Brian Drew, Colin Flint, Tony Gibbs, Pat Goodheart, Ray Grout, David Ince, Nick Morland, Glynne Parker, Chris Rostant, Duncan Simpson, Reginald Thompson and David Ward. Seven speakers gave talks to the Association with an average attendance of 40. The Summer Barbecue attracted 25 Members, the Christmas Lunch, 45 and 21 Members went on the visit to the Royal Navy Historic Flight at Yeovilton. The average attendance at socials, including the AGM was 16.

### **Treasurer's Report.**

Martin Pennel presented the accounts for the year. Expenditure totalled £3497 of which the largest item was stationery and postage at £1253. Hall hire was £500 and liability insurance £366. Income, excluding the XP984 funds, was £2929. Consequently, to maintain adequate liquidity in support of our programme of activities, the Committee agreed to increase the annual subscription, for the first time since the Association was founded, from £5 to £7 to take effect from the next renewal, for the 2019-2020 period. This increase is in line with inflation..

### **GENERAL DATA PROTECTION REGULATIONS**

Because of this new regulation the Hawker Association has to have a sound policy stating how the data held by the Association is to be used.

The important policy statement is:

*The personal data of Members - name, postal address, e-mail address and telephone number/s - is held by the Association in order to communicate with Members solely for Association business. This data will never be passed on to any party without specific permission from the Member.*

Should Members not agree with this policy please contact the Secretary, Barry Pegram, at 12 Becket Wood, Newdigate, Surrey, RH5 5AQ (Tel 01306 631125) to cancel their Membership.

### **THE 2018 SUMMER BARBECUE**

Organiser Ken Batstone reports...

On Wednesday 13th June, the annual Summer BBQ was held at the usual venue, the YMCA Hawker Centre in Richmond Road, Kingston. The weather was dry, bright and warm; not too sunny and not too hot, just right for we seniors. Thirty Members and guests, which was five more than last year, started to arrive from 12.15 and since the weather was so fine everyone spent the whole afternoon outside on the patio facing the river.

The BBQ was open from 1.15 serving sausages, chicken, burgers and a selection salads. The YMCA very generously provided us with red, white and rose wines which was very much appreciated. The event was so enjoyable that everyone was still sitting on the patio at 3.30 pm, when the raffle was drawn.

The Committee warmly thanked the YMCA staff for what was "the best yet" barbecue with the excellent food and wine, set off by lovely weather.

### **AIRCRAFT NEWS**

**Hurricane Mk IV** KZ321/CF-TPM/G-HURY has been sold by Vintage Wings of Canada to a new owner in Belgium.

**Hurricane XIIa** P3700 will appear in a new film 'Hurricane (Squadron 303)' about Polish RAF squadrons in WW2, to be released next year

**Typhoon RB396** restoration to flying condition by the Hawker Typhoon Restoration Group continues at Uckfield, Sussex. See their website for open-day dates and details of how to support this project. **Typhoon JP843** is also being restored to flying condition in British Columbia, Canada, by Typhoon Legacy Co Ltd. You can support this project via their website.

**Typhoon MN235**, on loan to the Canadian Air and Space Museum is returning to the RAF Museum.

**Harrier. Jet Art Aviation** is doing a roaring trade in 'museum standard' restored Harriers: GR3s XZ130 and XZ132, T2 XW269 and Sea Harrier FA2s ZD459, ZD580, ZD608, ZD615 and ZE691 are all listed as 'sold' on their website. ZD608 has gone to Greece and ZD615 to Canada.

**Fly Harrier Ltd** is planning to restore a Sea Harrier FA2 and a Harrier T8 to flying condition and will seek CAA approval to operate them in the UK. If any Members are inclined to assist in this latter endeavour please contact Peter Walker on 07725 554755 or [walkpw10@gmail.com](mailto:walkpw10@gmail.com).

### **DUNSFOLD PARK**

It was a sad day for Dunsfold and the local area when, despite huge pressure from opposing groups and residents, on 29th March 2018, the large scale development of Dunsfold Aerodrome was approved by the then Secretary of State, Savid Javid. Many Members will have worked at Dunsfold aerodrome and will be saddened that the site was not returned to agricultural use as had been the intention when the land was used during the war to build the aerodrome.

### **A VIEW FROM THE FLIGHT DECK**

On February 14<sup>th</sup> our Chairman, Chris Roberts, spoke to some fifty Members about aspects of airline operations, especially safety. When Chris retired from fast jet test flying he had two options: Warton or get a new employer; unsurprisingly he chose the latter joining Thomas Cook's 'My Travel' airline flying, initially, the MD83 (a Douglas DC9/MD80 development) and then the Airbus A320, A321 and A330, so he is well qualified to speak on this subject.

The first scheduled international passenger flights were introduced by Air Transport and Travel Ltd on August 25<sup>th</sup> 1919 who flew ex-military DH 4As from Hounslow to Paris. The fare was £21 (equivalent to about £1000 today) and the fare is the same today...but the experience isn't. Then flying was for the elite, now it's for the masses.

Turning to security Chris said the before the nine-eleven event it was airline policy to co-operate with hijackers, the action taken being left to the Captain. Post nine-eleven lockable cockpit doors were introduced and mandated. This led to problems such as the case of the young German pilot who locked his Captain out of the cockpit so he could crash the

aircraft to commit suicide. This is a difficult problem because if a 'secure' way of being able to open the door from the cabin is devised, someone will leak it.

Nasty events include clouds with 'hard centres', for example Table Mountain near Capetown, and the effects of poor visibility on the pilot's perception of glide path angles which look much shallower than in clear conditions. Such consideration led to the development of the 'autoland' system utilising the standard airfield ILS (instrument landing system), the first use of which on a scheduled passenger carrying flight was in a Trident 1 on June 10<sup>th</sup>, 1965! In spite of this many people believe that it is not a safe procedure whereas in fact it is incredibly safe. Worldwide there has NEVER been an accident due to a system malfunction. It was suggested that greater fidelity than standard ILS glide slope and azimuth localiser would be better but that is not the case. What the pilot needs is the assurance that the performance of the ILS is safeguarded against interference from ground traffic. Advice to pilots is that if you have a landing problem (eg a failed engine) in clear weather "use auto land".

The centre console on a modern flight deck is the crew's computer interface for feeding in the data for navigation, flight modes etc and also for autopilot control. The pilot today is a systems operator rather than an aviator. The overhead panel carries the failure warning lights; the Airbus philosophy is that satisfactory systems operation is denoted by no lights. This leads to short check lists; one A4 page.

Traditional flight instruments have been supplanted by screens; up to five on the Airbus. All the flight data are displayed graphically and this can cause problems. In the traditional cockpits which had standard instrument layouts pilots were trained to carry out a scan pattern taking in all the vital information. With comprehensive screen presentations it is possible to become too engrossed in the detail of some particular aspect. Head up displays (HUDs), common for many years on military aircraft, are now available on airliners but some operators are not specifying them because of the training burden.

Navigation using maps and hand-held computers has been replaced by satellite global positioning systems (GPS) displays which "spoon feed" today's crew who may not even have to enter their route which has been pre-loaded by ground engineers. The displays show the route, the weather, the waypoints, the track and so on. The pilot task is to check the displayed track with beacon information using aviation charts.

Runways were then discussed with photographs of interesting examples. They differ widely in length, approach hazards and so on and are categorised according to difficulty as A, B or C. Cat A are routine, Cat B require the pilot to have special training and for Cat C a specific licence is required.

As for cabin crew they are not there just to serve meals but for safety. The size of the crew is proportional to the number seats and the number of exits, all of which have to be manned. The 'cosmetic' aspects of the job, for instance food and drink service, duty free sales, can distract the crew from observing possible safety issues. An important task is the passenger safety briefing. Many passengers do not pay attention to what is vital information for their own safety and for the safety of fellow passengers who may be put at risk by those who have ignored the briefing.

Remember, said Chris, that in an emergency the passengers' circumstances can change from carefree comfort to being in a wet, cold muddy field very quickly. Be dressed for what the weather will be outside should the worst happen during take-off and landing; in particular don't take your shoes off. Also, don't wear nylon clothing which melts when heated and **never, ever** stop to get your hand luggage from the overhead lockers. The delay could cause the death of passengers behind you. Locking the overhead lockers would be a solution to this real problem. For short haul operators hold baggage loading piece by piece is labour intensive, slow and expensive so charging for hold baggage was introduced by low cost airlines to drive more passengers to take cabin bags. (Long haul airlines use pre-loaded containers.) There are far too many bags in the cabin, said Chris, which affects safety directly and also increases the number of bags going through security checks - the more bags there are the more likely something unpleasant will get through. The little bar code sticker on your bags is very important as it will still be there if the main label is torn off. So always remove the old ones or your bag may end up in Moscow!

Regarding oxygen masks, some aircraft have chemical oxygen generators activated when the mask is used leading to a burning smell and warm gas - don't worry, that's normal, but passengers aren't told. Why are the cabin lights turned off for take-off and landing? Just so the passengers have some night vision if it all goes dark in an emergency. What about 'air rage'? If passengers do become enraged they will be tied up in restraint gear by the cabin crew, many of whom are being given martial arts training. Lithium batteries are a dangerous fire risk and not long ago they were not permitted on aircraft. Remember your laptop has them! A ban would be unacceptable at present, but it may come. Fire in the air is rightly feared by aircrew.

External collision hazard factors affecting safety include birds, bats and hail, the latter being capable of shattering windscreens. All that can be done is to deter and avoid. Flying through volcanic ash clouds causes the build up of deposits on stator and rotor blades seriously degrading engine performance so it is important to avoid such clouds.

The number of major accidents per million airliner departures has dramatically dropped from 6.21 in the 1960s to 0.57 in the 2000s. The big three causes in the period 2007 to 2016 were runway excursions, flight into terrain and loss of control in flight (LOC-I). The first two were reduced by technology, eg ground proximity warning systems, but the biggest killer is pilots losing control of a flyable aircraft. LOC-I kills more passengers than all other categories added together. The problem is tackled by upset prevention and recovery training (UPRT). The basic problem is the loss of situational awareness where perception does not agree with reality. Causes can be external such as weather factors including microbursts, or internal where the pilot "loses the place in the script" which not uncommonly happens during go-around procedures, spatial disorientation perhaps caused by acceleration factors, or confusion in interpreting attitude and direction indicators (ADIs) where the one in use differs from that which the pilot trained on at the start of his career.

Commercial pilots are trained on straight winged aircraft then go to the airlines to fly swept winged aircraft which have different stall behaviour. At the airline they will do type training on simulators and their first actual flight will be on an aircraft full of passengers! The simulators are high fidelity 'Level D' machines which incorporate aircraft avionics and electronic systems. However, the motion simulation is comparatively poor and can be misleading, more to some pilots than others, and no simulators provide post-stall feel because no modern airliner has ever been departed in a stall during flight testing so the data doesn't exist. So, should the airliner pilot find himself in a stall situation he remembers his training...in a Cessna! A Cessna does not behave like a swept wing airliner whose handling is more like a Hunter.

In 1982 the first wide-body jet was certified for two crew operation. Airworthiness requirements have not kept up with technology and the autopilot is still seen as a back-up to the pilot who will have to take over in the case of failure. The airworthiness requirements should recognise that the all the information needed to fly the aircraft is vested in the autopilot so it should be considered the primary system and qualified accordingly. Future aircraft need to be fully automatic and no pilot should be forced to take over when he is not ready.

Chris concluded by describing an advanced simulator he is involved with that addresses the shortcomings noted above. Desdemona is a development disorientation training simulator with optimised motion cueing based on side force rather than angular change. The gondola can rotate through 360 degrees about all axes at speeds to generate realistic g forces, there are innovative visual aids and the computation includes advanced post stall aerodynamics.

This comprehensive, well illustrated, wittily delivered and somewhat worrying talk kept the audience enthralled right to the end.

### **HARRIER SKI-JUMP TRIALS**

On March 14<sup>th</sup> Dick Poole gave a flight test engineer's view of the Ski Jump development and proving trials. He was in charge of the HSA flight trials at RAE Bedford.

The Ski-Jump was invented by Lt Cdr DR (Doug) Taylor and presented in his 1974 Southampton University MPhil thesis entitled The Operation of Fixed-Wing V/STOL Aircraft from Confined Spaces. This report contained several launch ideas, some of them very strange. However, the Ski Jump was the most practical and the principal was to launch a V/STOL aircraft from the Ski Jump ramp into a ballistic trajectory with a vertical velocity component as it accelerated into wingborne flight.

The report was taken to John Fozard, Chief Designer Harrier, at Kingston who distributed it to Airframe Engineering, the Pilots Department and Flight Test. Trevor Jordan and Ken Causer examined the aircraft launch performance, Doug Thorby looked at the undercarriage implications and Robin Balmer assessed flying qualities. The idea was deemed feasible and got John Fozard's full support .but a demonstration was needed.

The MoD funded trials objectives would be:

1. Demonstrate the feasibility of the Harrier STO (short take-off) from the ramp.
2. Measure STO performance.
3. Measure the undercarriage oleo closure to verify load predictions.
4. Identify any handling problems (pitch up) from the nose up pitch rate due to the ramp curvature. This was a concern as Harriers had experienced pitch ups after STOs off a flat deck where full nose down control had been needed. The ramp might make this worse. In the event it was found that the pitch down which occurred as the nose wheel fell off the end of the ramp cancelled the pitch up.
5. Achieve limiting performance launch conditions where the aircraft achieved horizontal flight after STO, neither sinking nor climbing.
6. Provide data to support an early decision to fit a ramp on HMS Invincible.

The standard Harrier STO manoeuvre is:

1. Normal method for runway or ship take-offs.
2. Ground/deck roll at full throttle with nozzles aft.
3. Nozzle rotation to predetermined angle at scheduled speed or deck end.
4. Aircraft leaves ground or deck and is pitched up from 8 degrees angle of attack (AOA) to 12 degrees to safely optimise wing lift.
5. Aircraft weight equals wing lift plus jet lift. Off a ramp aircraft weight would be greater than wing lift plus jet lift until lift is gained when accelerating during the ballistic phase.

The Ski Jump ramp to be built at RAE Bedford was designed by Kingston's Ground Test Services. It was 180 ft long, of circular arc profile and built from some forty, 40 ft wide planks mounted on hinged beams supported by jacks and adjustable props allowing the ramp exit angle to be varied from 6 degrees to 20 degrees via 9, 12, 15 and 17.5 degrees. At 6 deg the Harrier pilot could see over the ramp end but not at 9 deg. At 20 deg the ramp end was a formidable 25 ft above the runway.

Two test aircraft were used. The sixth Development Batch Harrier XV281 had a magnetic tape recording system covering a full range of aircraft handling and performance parameters. Production Harrier XZ136 had two A13 paper trace recorders. Both had head-up display video cameras, undercarriage oleo closure indicators and recorded engine bleed pressure which is related reaction control usage. Ground based instrumentation included ramp end speed cameras, kinetheodolites for trajectory recording, anemometers for wind speed measurement, air temperature thermometers for temperature correction, the Dunsfold F-47 take-off performance camera and a high speed cine camera to cover nose undercarriage behaviour.

The trials programme, flown initially by John Farley, was cautious and progressive:

1. Measure hover performance to establish installed engine thrust for use in launch planning.
2. Perform RVTO (rolling vertical take-off) alongside ramp from STO start point to give the pilot confidence in the performance of the aircraft.
3. Perform RVTO from ramp for the pilot to become used to the feel of the ramp surface which was a series of short flats created by the planks.
4. Perform light weight STO from the ramp selecting nozzles down as the ramp end disappeared from the pilot's view.
5. Perform a series of ramp STOs at a range of increasing weights, a range of centre of gravity positions and tailplane trim settings, in zero, head, tail and cross winds, with and without external stores, with the auto stabiliser on and off.

Risk reduction measures were:

1. Employ the usual incremental approach in test conditions.
2. Ensure performance margins were available by flying with reduced thrust (97% fan rpm) and adjusting the weight to give the desired thrust-to-weight ratio, having water injection available and the option to jettison the water, carrying jettisonable stores, having an AOA margin from the 8 deg normal to 12 deg, having engine limiter override available. All these factors, not all of which were available on every flight, would make a rapid increase in lift possible in the event that a sink should develop.
3. The undercarriage oleo closure boundary was checked with instrumentation and an extra margin was used with non-instrumented aircraft. Closure extent was confirmed by putting grease on the oleo which indicated the maximum compression.

Once the engine performance was established by the performance hovers, and using well known aircraft ground roll acceleration performance data, launch conditions could be planned to achieve a predicted rate of climb. Examination of the instrumentation data post-flight showed what had actually been achieved thus allowing planning the next launch. Undercarriage closure was also monitored as of course were handling qualities, pitch rate and control margins.

The flight test programme began with XV281 flying off the ramp set at 6 degrees exit angle allowing AOA to reach 12 degrees then holding. The pilot noted a 'clunk' as the aircraft left the ramp. This was the undercarriage legs dropping as they became unloaded and was cured by setting the exit plank at a reduced angle so the leg was unloaded gradually. Otherwise there was nothing untoward so the ramp angle was increased to 9 degrees. The performance improvement continued and the handling qualities were unaltered. At 12 degrees the 'natural angle' was found; there were no control demands on the ramp and airborne the aircraft automatically achieved the desired 12 AOA without any pilot action, the sink in the trajectory being just enough. Again, there were no handling problems and the performance gains continued.

The company two-seater, G-VTOL flew off the ramp at 15 degs which allowed John to demonstrate to other pilots that the ski jump was "the easiest way to get airborne in a Harrier". The trials continued through 17.5 degrees to 20 degrees where the ramp end was 25 ft above the runway so all you could see, said Dick, who flew with John off most of the angles, was a grey wall with a black stripe down the middle, so the take-off was "a real act of faith that you were going to get up and over it".

An interesting unexpected phenomenon was that at higher ramp angles less nozzle deflection was required to prevent the aircraft stabilising at a low air speed and not accelerating to complete the transition. It was concluded that at least 4 knot/second acceleration was needed so nozzle deflections were adjusted accordingly.

The proven benefits of the ski-jump launch were:

1. Much reduced deck run at a given weight.
2. Increased payload for a given deck run.
3. Need for lower wind-over-deck speeds to war-ship speeds easing ship handling.
4. Increased safety because for all launches the deck is inclined upwards away from the sea even when the ship is bow-down or pitching bow-down.
5. Guaranteed rate of climb.

For example with a flat deck a 600 ft deck roll allows take-off with a 10,000 lb load at 120 kn end speed. With a 15 degree ramp and a 600 ft deck roll the load is 13,000 lb at 110 knots. With a 15 degree ramp the 10,000 lb load can be lifted from a 200 ft deck roll at 70 kn. All the above are for a 25 kn wind-over deck. A 10,000 lb load equates to full internal fuel plus five 1000 lb bombs.

The first public demonstration was at the Farnborough Air Show in 19 . The army built a 15 degree ski jump using standard Medium Girder Bridge components. The ramp was assembled on the ground, the entry end was fixed in concrete, the exit end was hoisted by a crane then it was all propped up. This gave a catenary profile which resulted in a much smoother ride. The US Marines were so impressed by the ramp that they bought it; so another one had to be built for the Paris Air Show.

After many questions Dick was thanked for this excellent talk with lots of illustrations and videos.

## ROY ADOLPHUS

Ambrose Barber remembers...

Members will have noted with regret the death last autumn of Roy Adolphus.

Roy and his team had been responsible for the output of Kingston-designed aircraft as well as Hunter re-manufacture for many years. Joining Kingston's Experimental Department management from Napier, Roy became Experimental Manager on Ernie Rowe's retirement. He subsequently took over from Ken Saltrick as Production Manager at a critical juncture in putting the P1127(RAF) into production. Increasingly involved in the inter-factory transfer of output to Brough, Bitteswell and Hamble, he was appointed Executive Director Production and subsequently Divisional Production Director. Acknowledged as having the necessary 'anchorman temperament', he was much respected in Production circles.

## JOHN MOWINSKI

Roy Braybrook remembers an old colleague...

I only just discovered that my old friend and former HSA/BAe colleague, John Mowinski, had passed on. He was one of Kingston's great characters and he will be remembered by those who served on the commercial side, for instance Ann Martin and Colin (later Sir Colin) Chandler, and Paul Thompson. in market intelligence

I met John by chance in a Lufthansa B727 returning to London from the Hannover Air Show in April 1974. He was then working for the company at Brough. I encouraged him to request a transfer to 'Harry's', where the real action was, and in due course he turned up in our commercial department. In 1977 my even older friend, the late John Crampton, pulled off the first large-scale Hawk export sale with 50 Mk51s for Finland. John Mowinski was assigned to Colin Chandler's team that arranged the 100% offsets required by Helsinki. He subsequently married one of the translators sent to Kingston by our Finnish agents, Machinery Oy, to work on the Finnish language technical publications.

John was later seconded to the BAe Inc office, at Washington Dulles International Airport, where he was to market pre-used 'bizjets' that had been traded in against new-build HS.125s. In 1993 that business was sold to Raytheon (and on to Beechcraft in 2007). John remained in the US, moving to Atlanta, becoming a director of another company selling pre-used 'bizjets'.

He later posted a photograph in Facebook with his new wife, noting that it had taken 64 years to find her. Knowing John, it must have been a very fulfilling search. Having heard nothing from him for several years, I recently discovered that John had passed away on 28 August 2015. He was an outstanding friend and will be sorely missed.

The editor also remembers John...

I got to know John very well when I was Hawk Project Manager. We hit it off from the start and became real friends. We travelled together a lot in the Middle East and always had great fun as well as getting on well with our customers. He and I agreed how to treat customers. If they complain about something that wouldn't cost the Company the Earth, then don't argue - give it to them even if the contract said it was not our liability. Save the arguments for the big ones. It was a successful tactic leading to goodwill towards the Company and happy customers.

## BOOK REVIEWS

### **British Secret Projects: Jet Bombers Since 1949 by Tony Buttler. Second Edition.**

The recently published second edition of Tony Buttler's book is even better than the now fifteen years old first edition. It is considerably bigger (over 350 pages) with extensive newly researched information and many new illustrations. There is much to interest the Hawker enthusiast in this book which includes some fifty Kingston projects. A strong point is that the book has mainly original general arrangement drawings, photographs of company models and contemporary photographs and 'artists' impressions. This high quality production is published by Crecy (ISBN 978 19108091905) at £27.50, well worth it for the amount of painstaking research that the author has carried out into original sources.

### **The Aviation Historian**

In **Issue 23** I found the article on the compressibility problems of Kelly Johnson's Lockheed P-38 Lightning particularly interesting as was the piece on the politics behind Fairey Rotodyne project. The troubles of the unconventional SNCASO SO 8000 naval strike fighter also makes fascinating reading. A piece on the Armstrong Siddeley Viper reveals how they are used as snow blowers by the New York Metropolitan Transport Authority to clear railway tracks, not unlike the truck-mounted Avon used to clear Dunsfold's runway. This device, complete with its Trevor Jordan designed nozzle, can be seen at the Brooklands Museum.

**Issue 24** has a very informative article by Gp Capt Tom Eeles on Brough's Buccaneer covering design features, what it was like to fly, and development and operational histories. The author flew over 2,000 hours on both the RN and RAF versions. The tailplane and wing blowing systems, needed for operations from the small Royal Navy carriers, are covered in some detail.

Each beautifully produced issue runs to 130 pages and always covers a wide variety of aeronautical subjects by expert writers.

## MEMBERSHIP NEWS

We welcome new member Leslie Allen.

Sadly we record the death of John Farley and send our condolences to his family.

## MEMBERSHIP LIST - July 2018

**Seventy eight Members have not yet paid their 2018 - 2019 subscriptions. Their names are in bold below.**

Please send cheques payable to The Hawker Association to Barry Pegram, 12 Becket Wood, Newdigate, Surrey, RH5 5AQ. If you are **leaving** please let him know by post or by telephone on 01306 631125. Thank you.

**A:** Allan Abbott, Ken Alexander, Peter Alexander, John Allen, Leslie Allen, Peter Amos, **Terry Anstey**, Steve Apted, John Arthur, Alan Auld. **B:** Brenda Bainbridge, Lyn Baker, Colin Balchin, Ambrose Barber, **Derek Barden**, Peter Barker, Graham Bass, Donald Bateman, Richard Bateman, Ken Batstone, **Dennis Baxter**, Colin Bedford, Peter Bedford, Anne Beer, Brian Bickers, John Blackmore, Andy Bloomfield, **Melvyn Bluck**, **Keith Bolland**s, Paul Boon, Betty Bore, Pat Bott, Steve Bott, Bob Bounden, Mike Bowery, Alan Boyd, **Sally Bracher**, **Roy Braybrook**, Bill Brice, Dominic Brice, **Laurie Bridges**, Arthur Brocklehurst, Peter Brown, **Christopher Budgen**, Reg Burrell, Robin Burton, Clive Bushrod, Tony Buttler, Dave Byford. **C:** Richard Cannon, Reg Carden, Chris Carter, Tom Casey, Bob Catterson, Colin Chandler, Keith Chard, John Chitty, **Martin Churms**, Gerry Clapp, JF Clarke, John Cockerill, Hank Cole, David Collingridge, **Nigel Cook**, **Brian Coombes**, Jonathan 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