THE HAWKER ASSOCIATION

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EDITORIAL

As I write it is wet and windy in the garden; our long and dry summer is over - but we have Christmas to look forward to and our lunch together on December 10th. Ken Batstone will be taking bookings at the November meeting or by phone (see Programme, below).

In this issue two anniversaries are marked: Hawk and Sea Fury, Kingston's last jet and last piston engined fighter.

Sadly, we record the death of Kingston Chief Engineer Mike Hoskins and of Dunsfold test pilot Paul Hopkins.

Also reported are Kingston Aviation Centenary Project and Heritage Trust activities as well as our talks and annual outing. If that wasn't enough there are personal memories by several Association Members who have dared to submit them. There must be many more of you with interesting tales to tell. Please send them to The Editor, Chris Farara, 24 Guildown Road, Guildford, Surrey, GU2 4EN, tel 01483 825955, e-mail cjfarara@ntlworld.com.

PROGRAMME FOR 2014

Wednesday 8th October	"BAE Systems Today" - **Simon Howison**
Wednesday 12th November	"Sky-Hook" - **Heinz Frick**
Wednesday 10th December	**Christmas lunch** - 12.30 for 1.00 pm.

PROGRAMME FOR 2015

Wednesday 14th January	Social with quiz by **Les Palmer**.
Wednesday 11th February	"Brooklands, the Future" - **Allan Winn**
Wednesday 11th March	"Some Test Flying Stories" - **John Farley**
Wednesday 8th April	Annual general Meeting with video show.
Wednesday 13th May	Annual general Meeting with video show.

Simon Howison was, amongst many other things, Chief Engineer Harrier at Farnborough, **Heinz Frick** was Chief Test Pilot at Dunsfold, as were **John Farley** and **Chris Roberts,** and **Allann Winn** is the Director of the Brooklands Museum.

For tickets for the **Christmas Lunch** please see Ken Batstone at the November meeting or call him on 01932 229938. The price and full menu will be similar to last year's lunch which cost £16.50.

Unless stated otherwise, meetings are at YMCA Hawker, Kingston - the old Sports & Social Club - and start at 2.00 pm. Lunch and drinks are available beforehand, tea afterwards, and there is a large, free car park.

AIRCRAFT NEWS

HAWK - At the RIAT display the Red Arrows, to celebrate their 50th anniversary, flew with representatives from the Frecce Tricolore (MB339), the Patrouille de France (Alpha Jet), the Patrouille Suisse (F-5E) and the Breitling Jet Team (L-39 Albatross). Hawk lost against the Alenia Aer Macchi M346 for a Polish order for eight aircraft.

HARRIER - Falklands veteran Harrier GR3 XZ130 which has been at the Surbiton Air Training Corps HQ for nine years is to be removed by the MoD for health and safety reasons. It is hoped that a home can be found for it in Kingston or at the Brooklands Museum.

HUNTER - TMk7 XL618 has been saved and has moved from Caernarfon to the Newark Air Museum.

SEA FURY - The Royal Navy historic Flight Sea Fury TMk20 VX821 suffered engine problems during a display flown by Lt Cdr Chris Gotke at the RNAS Culdrose Air Day in July. During the display the engine started to emit dense smoke but continued to run, causing the pilot to make a forced landing. He approached with flaps down and undercarriage up. The undercarriage extended late and failed to lock down, collapsed and caused the aircraft to slew off the runway onto the grass after a smooth landing. Chris Gotke was unhurt. Damage to the airframe appeared minimal.

In April the 500mph Pratt & Whitney R-4360 Wasp Major powered racing Sea Fury T.20 "Dreadnaught" and a Cessna 210 collided over the sea near San Pablo Bay, California. The Sea Fury landed safely but the Cessna crashed in the sea.

TYPHOON - The RAF Museum's Typhoon 1B, MN235, has been loaned to the Canada Aviation & Space Museum, Ottawa, until 2017. The RCAF flew three squadrons of Typhoons during WW2.

HURRICANE - RCAF MkXII G-CBOE flew from Thruxton in July after a very lengthy restoration. It, together with Peter Vacher's Mk1 and Hunter Mk58 Miss Demeanour, is for sale at Platinum Fighters.

PUP & 1 ½ STRUTTER - these RAF Museum aircraft have been moved from Hendon to Cosford for a WW1 exhibition.

ISIS WAR

The RAF is operating pairs of Tornados from Cyprus at targets in Iraq about 600 miles from Akrotiri. The Times reported that on the first mission a Paveway IV laser guided bomb (cost £22,000) was dropped on a "heavy weapons position, possibly a mortar point" and a Brimstone missile (£100,000) was launched at a "pick-up truck", presumably armed. On another occasion four Brimstones were launched at a "pick-up truck and a minibus".

That's five Brimstones (£500,000) for two pick-up trucks and a minibus costing, say, £40,000 max if they were new, but they are certainly commandeered so cost nothing.

According to The Times a sortie from Cyprus to Iraq takes between four and eight hours so a six hour mission at £35,000 per hour with two Tornados costs about £420,000, not including the cost of the tankers.

Is it really cost effective to use two-seat, twin-engined, swing-wing supersonic bombers to attack, with sophisticated missiles, very soft targets? Of course not; but it's all we've got. All our single-seat, single-engined light attack aircraft are in the Arizona desert.

THAMES-SIDE MEMORIAL TO KINGSTON AVIATION

The Sopwith Tabloid seaplane 'replica', funded by the Kingston Aviation Heritage Trust and built by Steve Green and Ken Gillett at Brooklands, was the centrepiece in Canbury Gardens on September 20th at an event to unveil a plaque commemorating 100 years of aviation in Kingston upon Thames and to mark the 20th anniversary of the Thames Landscape Strategy project to protect, promote and improve the riverside environment between Hampton and Kew.

After introductory remarks by David Hassard, the Kingston Aviation Project leader, the plaque was unveiled by Tommy Sopwith, Sir Thomas's son, after he had given a short and entertaining speech about his father and the Sopwith company. Also present were Stella Pixton, daughter of Howard who flew a Tabloid to win the Schneider Trophy in 1914, and members of the Hawker family.

The Tabloid was positioned on the slipway in front of the Albany Boathouse where the original was launched into the Thames for taxying trials; it later flew from the Thames downstream near Teddington.

SIR THOMAS SOPWITH HONOURED

On the 18th September, before an invited audience, a bronze bust of Sir Thomas Sopwith was unveiled in Kingston Library. After an introduction by Chief Librarian Grace McElwee, Kingston's Heritage Councillor, David Glasspool, spoke on the importance of the example set by Sir Thomas, engineer and entrepreneur, to today's young people. Before cutting the red ribbon and unveiling the bust, Sir Thomas's son, Tommy Sopwith, shared some memories of his father with the gathering.

Representing the Kingston Aviation Heritage Trust (KAHT) who funded the project, Ambrose Barber, sculptor of the bust, handed over the ownership documents to Cllr Glasspool for the Kingston Museum and Heritage Service. Sadly, Les Palmer, Chairman of the KAHT which also funded the Brooklands Tabloid 'replica' was unable to attend.

The Sopwith bust is paired in the Library with a bust of Sir Sydney Camm, also by Ambrose Barber. Beside each bust is a panel giving a brief biography of these leaders of Britain's aviation industry.

HAWK 40th ANNIVERSARY

On 21st August 1974 Duncan Simpson flew the first Hawker Siddeley Hawk, XX154, from Dunsfold Aerodrome ….

In 1968-69 Gordon Hodson sought the views of the RAF and Ministry of Defence on what they needed to replace the inadequate Jet Provost and the troublesome Gnat trainers. He wrote a paper on his findings which led to the first preliminary design by project designer Ron Williams. Further exhaustive studies by the Future Projects Office under John Allen, guided by chief engineer Ralph Hooper and Gordon Hodson, on what was now called the P.1182, resulted in a submission against Air Staff Requirement 397 in competition with the British Aircraft Corporation Warton's P.59. Hawker Siddeley Kingston won the innovative fixed price contract for 176 aircraft which also included performance guarantees, introduced by Hooper, and maintainability and reliability incentive clauses, another new feature. Seen by some as a risky undertaking, in the event they resulted in huge savings for the RAF over the lifetime of the aircraft and very substantial payments to HSA.

The new trainer needed a new chief designer and another Gordon, GT Hudson, was appointed with Gordon Hodson as assistant chief designer. Harry Fraser-Mitchell was in charge of Hawk aerodynamics and Barry Pegram took care of wind tunnel testing. In August 1973 the HS.1182 was named Hawk and one year later on 21 August the sole pre-production aircraft, XX154, flew for the first time. No test instrumentation had been fitted to save time so that the Hawk would be ready to fly at the Farnborough SBAC Show. This appearance was important because the Hawk's main rival for export sales, the Franco-German Dassault-Dornier Alpha Jet, would otherwise have had the stage to itself. For the flight trials Andy Jones was appointed Hawk project pilot assisted by Jim Hawkins and your editor managed the flight development technical department effort.

Powered by the Rolls-Royce Turbomeca Adour, the performance of the Hawk exceeded the RAF's training requirement. This was a deliberate policy by Hooper and his team to allow development into a ground attack fighter to enhance the export sales potential. This multi-role capability was instrumental in achieving to date over 1,000 sales to 19

countries, outselling many-times-over the competing Alpha Jet. Within the number are 223 T-45 Goshawks sold to the United States Navy, against intense international competition, as their standard advanced carrier-capable trainer. Gordon Hodson directed the effort to develop this variant with McDonnel-Douglas, and to gain and implement the important contract.

In due course Roger Dabbs became chief designer ably assisted by Ted Pincombe and John Farrow on the export variants including the single-seat Hawk 200. Hawk export sales proved to be very profitable to HSA and BAe but the money went into the BAe coffers instead of funding Kingston projects. BAe also decided that Kingston could not cope with two successful programmes (Harrier and Hawk) so in 1989, after the Mk66 Swiss aircraft, Hawk design and manufacture were transferred to Brough, with final assembly and flight testing at Warton, where the advanced lead-in fighter trainer versions were developed. Keeping the Hawk up to date continues there today and a plum contract target is the new advanced trainer for the United States Air Force whose Northrop T-38s are rapidly running out of airframe life.

Note: Harry Fraser-Mitchell's outstanding Royal Aeronautical Society paper 'The Hawk Story' can be found on-line at:-http://aerosociety.com/Assets/Docs/Publications/The%20Journal%20of%20Aeronautical%20History/2013-01_HawkStory-Fraser-Mitchell.PDF

FURY SERIES 70th ANNIVERSARY

It is seventy years since the first of Kingston's last piston engined fighter types flew from Langley in September 1944 in the hands of Philip Lucas. It was Centaurus XII powered Fury NX798 designed to meet Specification F.2/43; next, in November, came the Griffon 85 powered LA610. Two further prototypes were completed: NX802 flying in July 1945 with a Centaurus XII and in 1947 VP207 with a Napier Sabre VII, the latter with Hawker project number P.1018. This aircraft is reported to have achieved 485 mph in level flight and was certainly Camm's fastest piston engined type.

Sea Fury SR661, with a Centaurus XII and arrester hook, but without folding wings flew from Langley, in February 1945, followed by the second, fully navalised aircraft (SR666) with a Centaurus XV, in October. The third, fully navalised aircraft (VB857), flew in January 1946, fitted with a Centaurus XXII.

The first production FMk X aircraft, TF895, flown from Langley in September 1946, was similar to SR666 but had the 2480 hp Centaurus 18. Of the subsequent identical forty-nine aircraft, some twenty were retained for trials purposes by Hawker and by the Aircraft & Armament Experimental Establishment (A&AEE), Boscombe Down.

In 1948 the Royal Navy decided that the longer range and greater load carrying potential of the Sea Fury, relative to the Seafire F.47, suited it better to ground-attack leaving the interception role to the last of the Spitfire line. The FBMk11s proved their worth in the Korean War.

Altogether 615 Kingston-built P.1022 Sea Furies, mostly the fighter-bomber FB Mk 11, were delivered to the Royal Navy. They were capable of 465 mph at 18,000 ft, could reach 30,000 ft in 9.8 minutes and had a service ceiling of over 36,000 ft. Export sales were to the Royal Netherlands Navy, the Royal Canadian Navy, and the Royal Australian Navy; land-based versions going to Pakistan, Egypt, Iraq, Burma and Cuba. Total production was 864 including a few two-seat trainers for Iraq and Pakistan, and 61 TMk20s for the Royal Navy.

Several Sea Furies are still flying today including a number of highly modified 'unlimited' class racing machines in the USA, some capable of 500 mph.

PAPER AEROPLANES - BREAKING THE RULES

Our July 9th talk was by Ed Hui PhD, of Teddington School. Born in Hong Kong but a long time resident in the UK, he invented a new solution to the engineering problem of paper aeroplanes which he presented at the Royal Aeronautical Society Annual Conference for Young People. He told the Hawker Association what he told them.

The paper aeroplane is the world's most popular form of aviation; it is safe, accessible, unregulated and has numerous manufacturers! It is, however, subject to three unspoken laws: 1. It must be dart shaped with a keel, 2. It must be thrown hard, 3. The rules of origami apply - no cuts or glue. Ed thought there was something wrong here as all the best gliders have high aspect ratio wings. The Concorde is a poor glider. *Editor's note* - John Fozard used to say that the (low aspect ratio wing) Harrier glided like a 2/3 full gin bottle.

Ed's engineering brief was that his paper aeroplane should be a high performance glider, not a dart, that it should be capable of stable indoor free flight, and be made easily and quickly from normal office supplies. So he devised the Paperang which is folded from a sheet of A4 paper using scissors and one staple. It is a flying wing with a span of 11 ½ inches, a chord of about 2 inches and a leading edge sweep of some 22 degrees. It has no keel but is folded to give a stiff leading edge spar. It is held in its folded shape with the staple. When carefully, and accurately, folded an aerofoil shape is naturally formed but washout is added and by bending at the staple a dihedral angle may be created. When trimmed, by gently adjusting the shape, the Paperang flies fast and flat, as demonstrated by Ed.

There is a final rule for the Papering - it doesn't have to be made from paper. Sliced polystyrene sheet makes a very light, slow flying Paperang. Ed demonstrated that one of these can be slope-soared and steered round a room by chasing it with a flat inclined board held behind and below the glider. Polystyrene, unlike paper, is not sensitive to humidity so a carefully trimmed glider maintains it shape and flying qualities.

Ed also spoke about early hang gliding at Swansea University where the fabric swept back wing mounted on a keel assumed a parabolic aerofoil shape with washout giving pitch and roll stability. This was the inspiration for the Paperang. Ed showed a remarkable video of a hang glider flying very low at constant height over a lake.

The vote of thanks for this fascinating talk and demonstration was given by David Hassard

Instructions can be found at www.paperang.com/Paperangshare.pdf. To see Ted lecturing and demonstrating try www.youtube.com/watch?v=GkSxZQChMsA. Sliced polystyrene can be obtained from Slater-Harrison (Google them).

IMPERIAL WAR MUSEUM VISIT

On the 10th September Members met at the IWM, newly reopened after a multi-million pound refurbishment, for a visit organised by Frank Rainsborough. We were given an introductory talk covering the history of the museum and pointing out some of the new features. Afterwards Members split up and explored as the fancy took them.

The museum is much changed with many items moved elsewhere and new exhibitions organised. Of the latter the First World War exhibition and the painting galleries were well worth visiting. The former explained how the war started, why it continued, how the Allies won, and its impact on people's lives across the globe. The weapons and equipment utilised were shown, including Sopwith Camel, N6812, suspended over a simulated trench, with a Mk V tank close by.

Hanging in the atrium above a V1 'Doodlebug' and a V2 rocket were Harrier GR9, ZD461, a veteran of Afghanistan, and Battle of Britain Spitfire Mk1, R6195. Other items of particular interest were a 'Little Boy' atomic bomb and a WE177 nuclear weapon as carried by Sea Harriers. The wreckage of a Mitsubishi Zero and a Lancaster front fuselage completed the aircraft exhibits. In the picture galleries on the top floor was displayed a large collection of war-related paintings of outstanding quality by many famous war artists, several with aviation interest including 'Building Flying Boats' by Flora Lyon and a dogfight painting by RFC pilot Sydney Carline.

The IWM is now much more spacious and airy than it was before but to create the effect many important exhibits have gone, some to the IWM at Duxford. There is now more 'interpretation' - ie lots of panels with writing - and the labelling of exhibits is somewhat idiosyncratic in that the labels are not on or by the item! One has to find information boards, which have a plan of the area, on which the pieces are named. Nevertheless, the IWM is certainly worth a visit and those of us who went had an enjoyable day.

HAWK MEMORIES

Graham Weller, who was privileged to be part of the design team that came up with the final configuration for the Hawk remembers….

I joined the Kingston design team on 4 September 1972 and after a foreshortened graduate apprenticeship of six months, settled into what was then called 'Propulsion Integration' spending my first few weeks working on the P.1182's engine intake design with Kit Milford. I also worked with Jim Calkin on performance prediction and seemed to spend weeks if not months turning computer output into performance graphs.

After a visit to the USA, I returned with one of the first desk calculators to appear in Airframe Engineering (a $10 Commodore which worked a treat), later replaced with an HP25 which I still have - somewhere. I was involved in low- and high-speed wind-tunnel testing of the intake configurations at ARA Bedford which was fascinating.

The first take-off 40 years ago was one of the most exciting events in a career that later saw me based in Washington and sending the telex back to Kingston that we had been selected for the VTXTS programme. Having also worked on the AV-8B and watched the first flights of the YAV-8Bs, it is a source of regret at not being around when the first T-45 took to the air.

However, the Kingston team was a world beater in every sense, and working with the two Gordons was a great privilege. The first Hawk mock-up fuselage was built at Kingston, from which we went straight to the first aircraft. If I recall correctly the move to metric was a major step for everyone, complete with a different drawing number format, etc.. Exciting times!

By the way, I recently found a Hawker Aircraft Ltd. letter to my grandmother dated 28 Nov 1944 confirming her bonus of 4/11d - she worked on Hurricane production at Langley it seems.

A BRUSH WITH THE LDA-01

Richard Cripps remembers David Lockspeiser's aeroplane…

The following article is short on hard facts such as dates and names. The incident described did not seem at the time to be so significant as to justify documentation. However the recent report of the death of David Lockspeiser jogged my memory, and I thought it worth sharing with the Association.

The life of a technical apprentice at the Kingston Factory was usually fairly well ordered, a succession of moves around the facility to gain experience in the functioning of the various production, technical and management departments. However the apprentices as a body also provided a useful pool of temporary labour from which individuals could be deployed for any unusual tasks that arose. So it was that one Monday morning in (I think) 1970 I was instructed to report to the old Valve Test House.

Those familiar with the Kingston Factory may remember the Valve Test House. It was a small enclosed workshop located in the Fitters' Department in the north west corner of the production building, beneath the balcony that ran in front of the Works Management offices, but at the time I am describing its functions had recently been combined with those of the Materials Test House, and it stood empty.

On arrival I was joined by two other apprentices with whom I was familiar although their names escape me. We found that the enclosure now contained several aluminium alloy sheets, pre-formed with an aerodynamic curve and pre-drilled, a box of other components and a simple assembly jig; and a drawing titled "LDA-01 Development Aircraft." It transpired that our task was to assemble the aerofoil sections for Mr. Lockspeiser's aircraft.

I say "aerofoil sections" because the aircraft was an exercise in extreme simplicity and minimal cost, a complete contrast to the Harriers around which our world normally revolved. Those sections were symmetrical with parallel sides, and formed both the wings and the tail plane - one each side at the back and one attached by its middle at the front, the aircraft being a tail-first, rear engine "canard". All the ribs were identical and the assemblies were held together with pop rivets, the use of which was comfortably within our skill set.

We set to work with enthusiasm, and after a couple of days had completed the first section and were well advanced with the second. However at some point, while I was out performing some other errand, one of the company directors (not specified) was observed peering in on the activity through the internal windows with a frown on his face. Shortly afterwards we were stood down and all the material vanished. Evidently the work was being done on the "old boy's network", and that network did not extend far enough up the command chain.

On reflection I was surprised that such a visible location was used for what appeared to be an unauthorized activity. The Apprentice Training Workshop, where directors rarely ventured, could easily have accommodated it. We were also concerned that our having discussed the project with our apprentice colleagues might have let the cat out of the bag although none of us could recall any instructions concerning confidentiality.

Anyway, we derived a certain amount of satisfaction from our minimal contribution to the project, particularly when a photograph of the completed aircraft on its first takeoff appeared on the front page of the "Daily Telegraph"!

FERRY FLIGHT OF Mk53 HAWKS TO INDONESIA - PART 1

Dick Poole remembers an adventure from his time in Flight Test at Dunsfold…

The Indonesian Air Force had ordered a substantial number of Hawk Mk 53 jet trainer aircraft and it was decided that they should be flight tested and accepted by the customer at Dunsfold aerodrome. Once the property of the IAF they were to be ferried to Yogyakarta by aircrew supplied by British Aerospace. The aircraft were normally ferried in pairs for logistic and safety reasons and I was asked to take part in the ferrying of the 4th pair leaving the UK on 6th January 1981. The expedition was to be led by Dunsfold test pilot Chris Roberts and Jerry Crumbie, an instructor contracted to train Indonesian pilots in England. I accompanied Chris in aircraft LL5307 and Jerry flew LL5308.

The ferry route was Dunsfold to Malta, Luxor, Bahrain, Bombay, Calcutta, Bangkok and Butterworth in Malaysia to Yogyakarta and was flown with 100 gallon drop tanks on the inboard pylons of each aircraft. Each aircraft also carried an empty under-fuselage gun-pod with the ammunition tank loaded with ground locks, covers other supporting equipment and personal kit wrapped in polythene bags for protection from vented hydraulic fluid and engine oil.

The route was planned with some two-leg days and with rest days at Bahrain and Bangkok. Ferrying these military aircraft across each country required a diplomatic clearance that was valid for three days only so the rest days were built into the plan to provide buffers to enable minor unservicabilities to be sorted out without the risk of overrunning the validity of the clearances. Communication difficulties would be expected to make negotiating extensions of the clearances down the route to be very difficult.

At each refuelling stop the ferry leader had to satisfy the requirements of the local bureaucracy, pay bills, check the weather and file a flight plan, usually some distance from the aircraft. This left the second pilot to turn around both aircraft so a flight test observer was provided to share this task, especially important on the two-leg days in the demanding ambient conditions of Africa, India and Asia.

Dunsfold to Malta - 6 Jan 1981 (Duration 2hrs 45min)

We made a formation take off from Dunsfold on runway 25 at about 10 am with Chris leading. We then returned for a pass along the runway before heading off to the south until cleared by air traffic to climb to join the airway system for the flight to Malta. This involved cruising above 35,000 ft at a ground speed of approximately 7.5 nm per minute. For air-traffic control we were identified as 'Hotel Alpha Whiskey Kilo formation' and we communicated with them on VHF. Inter aircraft communication was on UHF and we met the radio redundancy requirements as a formation. On arrival at Malta we

set about what was to become the standard routine for overnight stops. This consisted of refuelling, oxygen replenishment, fitting of undercarriage ground locks, attaching intake covers, making a quick inspection of sight glasses, tyres and the airframe in general and removal of personal gear, in its essential plastic bags, from the under-fuselage gun pods. Having prepared the aircraft for the next leg of the journey we took a taxi to our hotel, showered, went to dinner in a fish restaurant in Slima and then to bed.

Malta to Luxor - 7 Jan 1981 (Duration 2hrs 55min)

After an early breakfast we did the aircraft Daily Inspections, loaded equipment and personal kit, filed our flight plan and checked the weather reports for what was to be our first two-leg day. Luqa airport was relatively chilly and we were glad to board the aircraft and reach the comfort of the ECS system.

We made a formation take off on runway 140 and climbed steadily to 41,000 ft heading out over the Mediterranean in an easterly direction until we were south of Sicily. Here we altered course to a south easterly heading aiming to cross the North African coast at El Daba and then traverse the desert until we reached the Nile, which we followed to Luxor. The course of the Nile was emphasised by its bordering vegetation as a result of irrigation and which terminated in dun coloured desert. Whilst Luxor is a civil airport supporting the tourist trade visiting the valley of the Kings it also incorporates a number of concrete hardened aircraft shelters covered in rock and sand. A number of anti-aircraft gun sites could be seen around its perimeter.

We landed and taxied to a hard standing away from the airliner apron and Chris set off to meet the operations staff to file our flight plan, clear customs, check the weather and pay an extortionate fee to the Egyptian authorities.

Our parking area was almost deserted but not far away was a collection of stray dogs that padded around apparently aimlessly in the midday heat. One, which from a distance could have passed as a pedigree black Labrador, selected a patch of black asphalt taxiway to lie down on and when a B737 approached rose at the last possible moment, shook itself and ambled out of the way. As soon as the aircraft had passed it shuffled back to its resting place and stretched out as before. Once Chris returned we quickly retreated to our cockpits looking forward to the comfort supplied by the CAU from engine start. On receipt of clearance to taxy we headed out to the runway for a pairs take off lead by Chris.

Luxor to Bahrain - 7 Jan 1981 (Duration 2hrs 5min)

After take off we headed east and climbed to 37,000 ft to cross Saudi Arabia and on to Bahrain International Airport and a slip day. The early part of the flight included the crossing of the Red Sea that appeared to be a deep blue colour with what looked like white sandy beaches which contrasted with the dun coloured surface with some black rock or tar we had got used to seeing. Periodically whilst flying over Saudi airspace we observed some large airfields but were much too high to identify any aircraft that might have been on them.

Bahrain to Bombay - 9 Jan 1981 (Duration 2hrs 50min Distance 1310nm)

Chris decided to hand over the lead to Jerry on this leg and we formed up on his starboard side for our pairs take off. On past delivery flights the aircraft had flown to Karachi on the way to India but a strong tailwind was forecast so it was decided that the formation could make Bombay in one go with the option of diverting to Karachi if tailwind did not materialize. In the event the tailwind was around 60 kts and we were able to fly above 40,000 ft so we had adequate fuel reserves

This leg of the flight was almost entirely over the water of the Arabian Sea and because of the need to stay out of Iranian airspace was almost out of sight of land for some time. We took a great interest in spotting the wakes of ships 41,000 ft below in case some engine problem might result in the need to eject over the sea. We were also out of VHF range of air traffic control and had to request nearby airliners equipped with HF radios to relay to them our reporting point arrival times and ETAs at the next one. Half way across we sensed a momentary change in the note from the CAU that caught our attention for a few seconds before it died away not to recur again on our journey.

After about 2 hours 30 minutes in the air we sighted the coast of India and on crossing the coast headed north to Bombay International Airport . The atmosphere was very hazy and we over-flew the city that looked hot, dry and dusty with sprawling slums intermingled with areas of more affluent dwellings. Once on the ground Chris asked control if we could park on the apron outside the terminal, as past ferries had done, and we were directed there and shut down to face the battle with Indian bureaucracy.

We climbed down from the aircraft in the hot sun and carried out the normal turnaround tasks, put the covers on the intakes and ground locks in and then found that the airport had changed dramatically since the last ferry went through. The adjacent terminal had been demoted to domestic flights only as the brand new international terminal was now operational. This accounted for the lack of large aircraft in the vicinity of our parking slot and meant that all flight planning, customs and immigration activities were located some distance away in the new buildings. Our refuelling activities attracted a large number of spotters who asked lots of questions about the Hawks and held heated debates amongst themselves as to its performance. I supervised the refuelling and at the end the Indian bowser driver presented me with a small bottle containing fuel and a number of particles to examine. I was horrified thinking that he had filled the aircraft with contaminated fuel and very relieved that the particles had been added to the bottle to indicate that it did not contain any water. To prove his point he poured out some of the particles onto his palm and spat on them, whereupon they immediately turned blue.

Part of the documentation necessary to obtain entry and exit from each country is the provision of a General Customs Declaration and it became apparent that minor officials would cease to be obstructive once given a copy. Chris feely distributed these and eventually a customs officer dressed in a white naval type uniform cleared the paperwork and accompanied us back to the aircraft in order to seal it until departure. This process consisted of removing a ball of used masking tape strips from his pocket and using two to stick a piece of printed paper across the canopy to fuselage gap adjacent to the opening handle. He had also been useful in that he appeared to have the authority to flag down airport traffic to drive us to the aircraft. He was not too pleased when he heard that we needed to have the aircraft unsealed at 05:30 on the following day.

With the aircraft put to bed we took a short taxi ride to the Airport Centaur Hotel, a large oval shaped building with gardens and a pool in the centre and rooms with noisy, yet welcome air conditioning. The following morning we breakfasted on tropical fruits such as mangoes and papayas and met our customs man by the aircraft and observed him retrieving his masking tape and returning it to the ball from his pocket.

Bombay to Calcutta - 10 Jan 1981 (Duration 2hrs 5min)

This leg of the journey was a bit disappointing as the haze to the north of us obscured the Himalayas and Everest was invisible. The terrain below was sandy brown and not very interesting but we were entertained by the air traffic exchanges between Indian air traffic and a Luxemburger flying some form of air freighter. It appeared that neither could fully understand the other but eventually tiring of these exchanges Chris interjected a few words that seemed to solve the problem.

We arrived at Calcutta before lunchtime and set about the usual turn round tasks and encountered an unwanted unserviceability. On refuelling the port drop tank on Chris's aircraft it failed to fill so we were left with an 800lb fuel asymmetry and had an interesting debate on what course of action to take. The piloting view was that we should use the gravity fuelling facility (drop tank filler cap) to fill the tank and hope that the pressure changes encountered in flight would cause fuel to begin transferring again. This had the advantage in that we would be symmetrically loaded for take off. The length of the next leg to Bangkok and remaining legs did not require any drop tank fuel and this option was adopted. (To be continued)

BOOK REVIEWS

'HARRIER, the Biography' by Jonathan Glancey

On no account buy this book (Atlantic Books, London, £8.99). This is not a serious work but a hastily written, ill informed piece of journalism. I noticed 57 paragraphs containing at least one error of historical fact, misconception or technical nonsense, and that just in the areas in which I have some expertise; what's wrong with the rest of the book I can only surmise. Some typical howlers: Sopwith bought the ice skating rink at Kingston; the P.1127 shoulder wing protects the fuselage from the hot exhaust; air from the reaction controls blows over the ailerons; XP836 was lost due to an intake problem; the VJ-101 was the first VTOL aircraft to break the sound barrier (it was P.1127 XP836); the Kestrels were sold to the US at knockdown prices; the YAK-38 was based in part on the P.1154; sideslip vanes were devised as a result of Rosburg's crash; the GR5s were built in St Louis and shipped across the Atlantic; the night attack Harriers had radar; John Fozard designed the Hawk……..

The pity is that because the author is well know this nonsense will be perpetuated by other writers whose idea of research is to plagiarise!

'THE DESIGN AND DEVELOPMENT OF THE HAWKER HUNTER, the Creation of Britain's Iconic Jet Fighter' by Tony Buttler

This handsome book (The History Press, £20) is everything that Glancey's book is not, and certainly should be a standard reference on every Hunter admirer's bookshelf. The title describes the book precisely as only a paragraph or two are devoted to the Hunter's service career. Design, flight testing and development, service trials and experimental testing are covered in admirable detail and all are copiously illustrated with photographs and manufacturer's drawings, many not published before. The author has not regurgitated information from existing books but has thoroughly researched primary sources including those at the National Archives, the Brooklands Museum, and the Rolls-Royce Heritage Trust, and delved into the 'Flight' magazine archives. The result is a quality book packed with information all beautifully presented by the publishers. The author is to be congratulated.

'THE AVIATION HISTORIAN'

Nick Stroud's quarterly goes from strength to strength - with lots of Hawker interest. Issue No 8, for example, with the first production Hunter on the cover, has articles on David Lockspeiser, the Indian Air Force Hunters, a Danish Hunter landing safely without its pilot and the Sopwith Tabloid that won the 1914 Schneider Trophy. Beautifully printed and designed in a refreshingly straightforward style it is always a pleasure to handle and read. Issue No 9 is now out with a detailed article on the German P.1127 contemporary, the V/STOL EWR Sud VJ101.

MEMBERSHIP NEWS

Sadly we record the deaths of Chief Engineer Mike Hoskins and test pilot Paul Hopkins and send our condolences to their families and friends. Unfortunately we did not hear of Mike's death until after his funeral so were unable to alert HA Members.

We welcome new Member Alistair Robertson.

MEMBERSHIP LIST OCTOBER 2014.

Members who have not yet paid their subscriptions for 2014 - 2015 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.

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