



**NEWSLETTER 52 - WINTER 2018**

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## **EDITORIAL**

I can't believe it's nearly Christmas again. Please see below for details of the Association lunch on December 12<sup>th</sup>. Do come and bring a guest to this historically excellent event.

You will find lots of interesting articles by Members in this issue together with accounts of talks and the visit to Wittering.

The Editor wishes all his readers a merry Christmas and a happy and healthy 2019.

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 36 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 FOR 2018**

Wednesday 14<sup>th</sup> November

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

Wednesday 12 December

**Christmas Lunch**

## **PROGRAMME FOR 2019**

Wednesday 9<sup>th</sup> January

Social

Wednesday 13<sup>th</sup> February

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

Wednesday 13<sup>th</sup> March

Fresh Interests Since Retirement - Ambrose Barber

Wednesday 10<sup>th</sup> April

Annual General Meeting

Lt Cdr **Chris Goetke** is the CO of the RN Historic Flight and Ambrose Barber was Commercial Director and, of course, our first Chairman.

## **Christmas Lunch**

On Wednesday, December 12<sup>th</sup>, the annual Association Xmas Lunch will be held as usual at the YMCA Hawker Centre. The price this year is just £1 higher than last year at £17.50 per head. This is the first increase since 2012. The Menu will be: a glass of wine on arrival, prawn cocktail or tomato soup, roast turkey with trimmings (or poached salmon or similar - please advise when you book), desert, coffee or tea with a mince pie and chocolate mints. Please send your cheques to Ken Batstone at 42 Kings Road WALTON ON THAMES KT12 2RA or phone him on 01932 229938 with any questions.. Payments must be received by December 7<sup>th</sup>. Lunch will be served at 1.15pm and Members and guests may arrive from midday onwards, but not earlier please. Anyone who has paid but find they are unable to attend will be refunded if they let Ken know before December 7<sup>th</sup>.

## **JOHN FARLEY COMMEMORATION AT BROOKLANDS**

On October 10<sup>th</sup>, a beautiful sunny day, some relatives, friends and colleagues gathered at the Brooklands Museum to remember and pay tribute to John Farley, test pilot and personality extraordinaire.

The Napier Room was soon alive with excited talk as guests greeted each other and recognised old friends, possibly not seen for some years, before reminiscing about their times with John. On a large screen a video scrapbook of photographs of John from childhood to ‘elder statesman’ of aeronautics and aviation played in the background.

Once the gathering had settled into their seats a welcome and introduction was given by Chris Roberts who then spoke of the young John, his apprenticeship at RAE Farnborough and his early career. John Heron recounted John's RAF career in the UK and Germany. John's time at the Empire Test Pilots' School and his research flying in Aero Flight at RAE Bedford was covered by Dick Poole whilst his Hawker years and Harrier involvement were remembered by Colin Wilson. Dave Southwood covered John's work post BAe, his teaching and his role inspiring the next of generation of aeronautical engineers and aviators. Finally Chris Roberts returned to summarise John's career and Adele, John's widow, closed the formal part of the event.

A buffet tea with plenty of sandwiches and cakes was then enjoyed as guests circulated and talked with friends and colleagues. Of course John's death was sad but this commemorative gathering had been a happy event where those present could celebrate the extraordinary life of such a likeable, much loved and talented man.

Thanks are due to Chris Roberts for organising the event and to the Brooklands Museum for the venue and refreshments.

## VISIT TO RAF WITTERING, 26<sup>th</sup> SEPTEMBER

The Association's annual visit this year, organised by Frank Rainsborough, was to the Heritage Centre at Royal Air Force Wittering. Some 25 Members and friends made their own arrangements for getting to the air station which is near Stamford, Lincolnshire, and were greeted by our host, Corporal Lisa Morris, near the Harrier GR7a 'gate guardian', ZD469, clearly visible from the A1 highway.

After signing-in and receiving official passes we were taken by motor coach to the Heritage Centre for the start of a two hour visit., where volunteer Bob Farrell gave us a potted history of the air station which opened in 1916. From 1968 to 2010 it was known as the 'Home of the Harrier'. We were allowed to visit a number of rooms containing historical information and artefacts including Harrier conversion course group photographs amongst which, of course, we found a youthful image of our Chairman, Chris Roberts (233 OCU Course No. 10). A cheque for £250 was presented to the Centre.

We then, complimentary colour guide in hand, walked to the main area of interest, the hangar. This proved to be a treasure trove for any Harrier enthusiast, housing several aircraft and lots of items and memorabilia associated with the Harrier. The place was spotless and all the contents were accessible, clean and well displayed and cared for. The aircraft were: Harrier T4 XZ146, GR3 XV799, GR3 XW923 cockpit section, GR7A ZD318 (the first UK Harrier II/GR5) with every pylon loaded with stores, AV-8B 162964 cockpit section and GR1 XV279 ( the fourth Development Batch Harrier) still carrying the legend Hawker Siddeley Harrier (hurrah!)

Ancillary items included a cutaway Pegasus, a complete Pegasus, a gun pod, several external stores pylons, a glass case containing a very large number of 1/72<sup>nd</sup> scale model Harriers of various Mk's and liveries and a 1/24<sup>th</sup> scale GR1. There were three Harrier wind tunnel models: a GR5 with LERX, AAR probe and a wide selection of external stores, a GR1 hot gas rig model with its associated pipework, and another wind tunnel model with a lengthened front fuselage, FA2 type cockpit and nose, a T2 rear fuselage and a wing with square cut tips. There were also two front fuselage models, one with a bulbous radar nose, the other with a finely tapered nose.

A number of large placards were on show: RAF Cottesmore Joint Force Harrier, Welcome to Happy Four, Harrier Force South (presumably Falklands), a number of large wall plaques: Joint Force Harrier, Joint Strike Wing - Joint Force Harrier, and some bar signs: The Hover Inn, The Old Forge Inn - "Ogu Bar". A real treasure was a varnished wood plaque with the Tripartite Evaluation Squadron roundel at the top beneath which was the inscription "To All Who Serve in the Kestrel Evaluation Squadron from Hawker Siddeley Aviation Ltd, 1965".

After thanking our very helpful hosts for an excellent visit, we handed in our passes and set off down the A1 for home. A long day but well worth the journey.

## AIRCRAFT NEWS

**Hurricane 1** V7497/G-HRLI has flown after a rebuild by Hawker Restorations. It will be operated from Duxford.

**Typhoon 1b** MN235, belonging to the RAF Museum, is back in England from Ottawa at RAF Coningsby.

**Gnat F1** G-SLYR, owned by the Gnat Display Team, an ex Indian Air Force aircraft built by Hindustan Aircraft Ltd at Bangalore, has completed its restoration to flight condition at North Weald.

**Hawk T1** XX227, the last remaining aircraft from the first team, had been retired. Thanks to Keith Bolland for this news.

## ERNEST HEMINGWAY VISITS DUNSFOLD, D DAY AND DIVORCE

On July 11<sup>th</sup> Dick Wise spoke to the Association about the famous and important American literary author who came to England in the Summer of 1944 as a war correspondent. Dick was a Hawker apprentice in 1961 and via the Avionic Systems Department at Kingston and Dunsfold, where he was a flight test observer in the TMk8M Hunter used for Sea Harrier avionic systems integration work, rose to become the Harrier Project Director in 1998. Afterwards he worked for BAe in the USA in senior positions covering sales and marketing, and Joint Strike Fighter support. He was appointed OBE in 2005. Since retiring Dick has researched the life of Ernest Hemingway, particularly his time in England during World War II. The result was his first book 'Hemingway in Wartime England - his life and times as a war correspondent', reviewed in Newsletter No. 50, Spring 2018.

Dick had a long standing interest in Hemingway and noticed many errors in existing biographies which prompted him to embark on his project. Dick went to primary sources including US and UK national archives, diaries, museums and had conversations with people who knew the author. Importantly he uncovered new sources. The research took seven years, the writing three.

Hemingway was born in Chicago in 1899. His books made him famous and his writing style had a profound effect on US literature. He had a high profile (in today's parlance he was a celebrity) and for marketing purposes presented a 'macho' life style pursuing big game hunting and fishing, boxing, bull fighting, drinking and womanizing (he was married four times). He served in the US Red Cross in World War I in Italy and During the Spanish Civil War he was a war correspondent (warco).

In 1941 Hemingway was living in Cuba on the proceeds from his successful novels, particularly 'For Whom the Bell Tolls'. He spent his time drinking, fishing, yachting and informal intelligence gathering. However, he was rejected as an agent by J Edgar Hoover, Director of the FBI, who considered Hemingway to be a Communist because he had supported the Republican cause in the Spanish Civil War. At that time there was a threat to the east coast of the USA from U-boats and because of a shortage of Naval vessels, private yachts, including Hemingway's, were employed to patrol the area

His wife at that time was Martha Gellhorn, a famous and successful novelist, travel writer, journalist and now a warco in Europe. Having flown the Atlantic in the BOAC Boeing 314 flying boat, 'Berwick', Hemingway joined Martha in London where he was accredited to the RAF to report on the war effort for the prestigious Colliers magazine. He lived at the Dorchester Hotel with many other warcos, near the US Embassy in Grosvenor Square. London was battered and shabby yet was the R & R destination for allied forces including 1.5 million Americans. There was considerable friction between the British servicemen and the US GIs who had smarter uniforms and much higher pay. The Brits said the Americans were "overpaid, oversexed and over here"; the American response was that the Brits were "underpaid", undersexed, underfed and under Ike", General Eisenhower, the allies' supreme commander. In London Hemingway met Mrs Mary Monks, a journalist, whom he was to marry in 1946 after divorcing Martha. Mary was Hemingway's fourth and last wife.

Hemingway had to get accreditation by registering with the military authorities to gain access to briefings, for transport and a uniform; warcos were quasi staff officers. Accredited, Hemingway transferred to the USN as a Lieutenant to cover the D-Day landings. Unfortunately, Hemingway had suffered serious head and knee injuries in a car crash in the blackout following a party. He got himself discharged after only four days in hospital and, not at all fit, he was ordered to report to Portland Harbour with an overnight bag where he embarked on the USS Dorothea L Dix, an attack transport which was to transport 1000 troops, 33 Jeeps, a Cub aircraft and 24 landing craft. On board Hemingway was popular with the troops and he was photographed with the men and officers although the latter found him arrogant. The fleet was moored 11 miles off the Normandy coast for fear of long range German guns.

Hemingway was assigned to Lt Robert Anderson, 24 years old at the time, who would command four landing craft for the assault on Omaha beach. By the time Anderson's landing craft was near the beach, after the 11 mile run in, the men were cold, wet, seasick and tired, and Anderson's beach chart was blown away. It was Hemingway who spotted the Collville church spire identification point but the army lieutenant in charge of the men refused to land. Anderson withdrew but on the second approach the boat was waved off. On the third approach Anderson was ordered to pick up a seriously wounded sailor who was taken to a destroyer and on the fourth approach the army lieutenant again refused to land. This time Hemingway, observing the terrible conditions, ordered the troops off and they headed for the beach to join the battle. Back at the Dorchester Hemingway wrote his Colliers piece "Voyage to Victory" which was hailed as a masterpiece of war reporting. *(Ed: This can be found at <https://billdownscbs.blogspot.com/2014/12/1944-voyage-to-victory-by-ernest.html>)*

The RAF was badly in need of good public relations and a major task at that time was the destruction of the V1 launch sites hidden in France. The V1s were pilotless pulse jet propelled aircraft (equivalent to today's cruise missiles) flying at 400 mph at 2-3000 ft, steered by a gyro compass-autopilot system and carrying a 1800 lb warhead. The continual bombardment, directed principally at London, was causing extensive damage and thousands of civilian casualties.

Hemingway was posted to RAF Dunsfold, eating at the Gibb's Hatch Restaurant (now the Alfold Barn Restaurant) and drinking at The Three Compasses pub (still there) just outside the aerodrome boundary. North American B-25D Mitchell bombers were operating out of Dunsfold and Hemingway flew with the 28 year old Wing Commander Lynn in a 180 Squadron aircraft. Lynn was a quiet man whereas Hemingway had already exhibited his characteristic arrogance and boorish behaviour. The Mitchells flew in 14 'boxes' of six aircraft, each carrying eight 500 lb bombs, with a Spitfire escort. There was one bomb aimer per box. The main danger was from lethal anti-aircraft gun 'flack' which caused the Mitchells to weave, climb and dive to defeat the guns' target prediction systems; very uncomfortable for the crews. Lynn's Mitchells attacked the heavily defended V1 sites hidden in the Bois Cocquerel wood at low level so the bomb strikes could not be seen. Hemingway requested Lynn to go round again so he could see the damage; unsurprisingly Lynn refused. Hemingway's Colliers article about the raid was entitled "London Fights the Robots".

*(Ed: This can be found at <https://billdownscbs.blogspot.com/2015/08/london-fights-robots-by-ernest-hemingway.html>)*

Hemingway then left London after an eventful 62 days, returning to live in Cuba. If you want the full story buy Dick's well illustrated book, 'Hemingway in Wartime England - his life and times as a war correspondent', which is available from Amazon for just £8.90.

## **WIMPY WADE AND THE P.1081**

Roy Whitehead may have thrown new light on an old mystery...

In 1950 a P.1052, which was the swept wing version of the P.1040, was converted to become the one and only P.1081. This had a new rear fuselage with a straight-through jet pipe and swept tailplane. It was the forerunner of the Hunter and was yet another aircraft being used to explore the problems and possibilities of high speed flight. On one such test flight by Hawker Chief Test Pilot 'Wimpy' Wade, disaster struck.

On April 13<sup>th</sup> 1951 the P.1081 crashed. During a high Mach number dive 'Wimpy' had ejected but unfortunately may have done so too low for his first generation ejector seat to be fully effective and had not separated from it when it struck the ground. He didn't stand a chance.

The following morning I was called into the office of JD Stranks, the Chief Experimental Engineer. There 'Jumbo' Betteridge and I had the difficult task of unravelling the wire from the P.1081's pilot's voice recorder. The recorder was German, most probably one of the spoils of war. The fine recording wire was wound on Bakelite spools which had broken in the crash and the wire was badly tangled. We did our best to rewind a section of the wire but I never did hear if there was anything recorded by 'Wimpy' that gave any explanation of what had happened.

Twenty years later I was given a job that required the use of an electric actuator, a device that acts like an hydraulic jack. The very nature of our work in Experimental meant that we became 'squirrels' accumulating anything that 'might come in useful one day.' Consequently from our glory hole I was able to find an actuator that was ideal for the job; it didn't

matter that it was second hand. Having wired the actuator I found that it would not work so I stripped it down to find out why. I saw that the ram had gone to one end of its travel and jammed. I also saw that the contacts on the limit switch, which should have opened to stop the ram before it reached the end of its travel, had overheated and were welded together. I was able to free the ram, separate and clean the contacts and soon had a working actuator.

May I now stress that the words in italics in the next paragraph can only be regarded as hearsay.

I told my boss, 'Jumbo' Betteridge of the problem I had had and he informed me that this particular actuator was *the one that had been fitted to the tailplane of the P.1081* and that to his knowledge *it had been sent back to the manufacturers after the crash for inspection and had been returned to Hawkers as serviceable*. Under the circumstances rather surprising if true. However, our glory hole was the obvious repository for an unwanted actuator and we had been the custodian of this one for a very long time.

It then occurred to me that this actuator could possibly have been the cause of the crash of the P.1081 and I wondered aloud if anyone should be told of the fault that I had found but 'Jumbo' said that it was far too late for that and it was all in the past, anyway.

In 2001, the 50<sup>th</sup> anniversary of the first flight of the Hunter prototype, 'Aeroplane' magazine published a comprehensive article by Roy Braybrook about the Hunter. In the article Roy referred to the ancestry of the Hunter including the P.1081 where he said that the aircraft had a fixed tailplane. I referred to Frank Mason's book 'Hawker Aircraft since 1920' where he mentioned that the fitting of an electric tailplane actuator. I wrote to Roy telling him of the discrepancy between his article and Frank Mason's book. I also mentioned my experience with the actuator and my suspicion that it might have been the cause of the accident.

Roy made a few enquiries of his own and eventually replied that he had to agree that he was in error in saying that the P.1081 had a fixed tailplane and wrote to the 'Aeroplane' editor accordingly who published his letter. Roy also mentioned that there had been quite a few mishaps around that time, with Canberras and other aircraft, with 'runaway tailplanes'. My evidence of the jammed actuator, if evidence it is, could point to the possibility that 'Wimpy' was the victim of such a phenomenon.

## **AND MORE MEMORIES OF ALGERIA**

The Editor also has some Algerian Anecdotes....

As the Hawk Project Manager I was part of Peter Boxer's team putting together a Hawk manufacturing proposal to the requirements of the Algerian authorities - I can't remember which Ministry it was. Anyway, on the back of a requirement for some 35 Hawks they loaded a factory, an airfield and a training school. The proposal was to be prepared jointly by BAe and the Algerians. This meant that we visited Algeria for fact finding and discussions which would define the task. We would then go home, write the 'joint' report, hand it over on the next visit for review and amendment. Each time further requirements were added, each time the cost went up. This was pointed out to our 'partners' but we were told that that was their problem, not ours, so please add in the new items. Eventually the proposal was submitted to the Algerian treasury who rejected it as outrageously expensive - and are probably still laughing to this day.

I too stayed at the El Aurassi and had a similarly exciting time. On the first visit we checked in, took the lift to whichever floor our rooms were on and tried to find them. The corridor lighting was poor and most of the numbers had fallen off the doors so we had to work out which ones they were. I went into my room which was very hot so I turned up the air conditioning. In response all the lights went out! When the lights were reinstated, and the air con turned down, I started to settle in. There were strip lights over the wardrobe doors cunningly placed so that when the doors were slid open they blanked out the lights leaving a small table lamp as the only light source. I then thought I would use the loo. Sitting there I found my back was getting even warmer; the cistern had been plumbed into the hot water supply. We also had the water problem and the bath reservoir solution.

Next, dinner. In the restaurant we were impressed by the large menu. Unfortunately it was fictitious and the choice was minimal. I chose the veal cutlet. On arrival it was beautifully presented but trying to cut it, let alone chew it, was impossible. It really was as tough as the proverbial shoe leather. Availability of drinks was also a problem. Sometimes there was gin but no tonics or vice versa, beer was in short supply and the wine was 'variable' in quality. There was clearly a distribution problem.

We were driven round at ridiculously high speeds in black Government Peugeot 504 saloons. Sitting in front I went to put on the seat belt only to get an angry response from the driver. "No, no" he shouted. "Your safety is my responsibility". We also had a desert air base visit and were entertained in the officers mess. I don't recall many flies and the meal was OK. However, the dessert was large bunches of fresh dates which were delicious. I noticed my host rolling each date before eating it and asked him why he did it. He said you could feel if there were maggots inside! Why, I thought, didn't he tell me first before we started eating?

## **MORE TIME IN THE HAWKER INSTALLATIONS DEPARTMENT**

Karl Wingett-Smith remembers activities that were going on concurrently with those in his earlier article....

The Installations Department (ID) office was in a corner of the Experimental Shop at the river end of the Kingston site, beside us was the Structures Department and, in the more palatial area upstairs, was the Advanced Project Group. Within the main Experimental building, were two ID facilities: the Electrical section under Ron Leader and the Hydraulics test rigs that were under Hamish Waugh. I never knew exactly what Ron & Co got up to (electricians are not exactly my forte, things aren't live unless you get a big flash and bang when you join two wires); Hydraulics had two interesting rigs, though. One of these we all called Cloche Merle, due to its resemblance to the traditional Paris street urinal (a circular screen with a gutter and drain running around the inside somewhat below waist height. The virtue of that was that it enabled a gentleman relieving himself to raise his hat to a passing lady.) Despite my digression, that was ID's centrifugal test rig whereon fuel or hydraulic components were attached to a rotating arm while the gutter caught any escaping fluids.

The other was a wooden chair with a control column set up in front of it which, when connected to another, more complex, set of odds and ends (Derek Holden or someone else may be able to add more detail to this) created a hover flight simulator. Anyone, primarily the test pilots, would sit in that seat and try to keep the represented aircraft stable. Beyond the fact that, obviously, the pilots coped fine (as did Hamish who, I understood, flew Avro Ansons during WW2) while I, with a current PPL, failed miserably during the one go I scrounged on it.

When I first joined HAL the six P.1127s were under construction there. When they went to Dunsfold for final assembly their space was taken by a substantial number of Hunters that had been replaced in the RAF first line interceptor role by the new Lightning. The Hunters were mainly being completely refurbished to become the Mk 66 for export to India, while a few became two seat trainer variants. Fuselages and wings were trestled separately. When contractors were working on the roof and a fire was discovered there during their (and our) lunch break the Fire Brigade and Salvage Crews were called from their base just across Richmond Road. They arrived about 15 minutes after the alarm was raised! The fire crews played water on the roof and that brought down chunks of smouldering insulation that fell inside the shop, some of it landing on wings, more falling inside the open cockpits from which canopies and seats had been removed. Naturally a fireman's instinct is to pour water on anything that might flare up and this involved turning their hoses inside the cockpits. Those of us who were in the building decided that this really wasn't the best idea and grabbed CO2 extinguishers and waited underneath the wings so that we could use that and prevent water damage.

Also in the Experimental Shop was the Hunter Fatigue Test Rig in which some poor airframe creaked and groaned to its final destruction that occurred with a very loud bang 'when something broke' to be followed by the clatter of all the shackled weights used to simulate flight loads. Not exactly a quiet life, but more about noises later.

Cockpit pressure testing was also carried in the Experimental Shop. A large rectangular tank, rather like a swimming pool, had been sunk into the hangar floor, lined with white tiles and a guard rail placed all round; it was something like six feet deep and had a gimbal mounting at each end. A P.1127 cockpit was mounted on these, the pool was filled with water and the cockpit pressurised. The canopy protruded slightly above the water level so that it could be pushed to roll the cockpit section over to examine the underside etc. A good idea but it proved more difficult to turn over than expected. The shop foreman at that time was one Charlie(?) Price who had a reputation for never asking anyone to do what he wouldn't do himself. Rumour at the time was that he had been involved in undercarriage retraction testing on a Fury and been picked up by the tailwheel; a larger man might have suffered severe injury. Anyway, he climbed over the safety rail and, using a long pole, leaned hard on it to push the cockpit over. Whether the pole slipped or the cockpit moved suddenly I don't know; all I saw was that he fell into the tank. He emerged out the other side and I'll swear that he was bone dry above the knees. I am convinced that he included walking on water as just one of his capabilities.

The Robin Hangar across the yard held more of the ID test facilities: the air conditioning rig, the reaction control nozzle rig and the hover rig. Here the prime members of staff were Stan Williams, John Davey, Roger Samways, Tony Harris and Dave Tait, the last being our own fitter who could usually find ways of adapting these rigs for their various specific uses. Unofficially, certain 'foreigners' were made there. For example, a very simple bit of tin bashing created a 'hole' with a lead-in ramp all round that enabled us to practice short range putting on an otherwise level floor. Also, having broken a half-shaft on my Rochdale-Ford Special for the third time as I arrived in our adjacent car park one morning, it afforded me the opportunity to change the complete axle assembly. I found a fractured casing that had been missed by the two garages who had replaced the previous ones. The shaft that I removed showed evidence of fatigue, caused by flexing with every rotation. That old axle may have been discovered when the site was redeveloped and builders excavated for the foundations, otherwise its likely to be still buried there for posterity.

Most of these test rigs individually created a lot of NOISE! Also, even though we were literally next door to the Compressor House (run by Fred) with several large, 200 psi receivers between us, there was generally only enough air to run one of these rigs at a time. Inside our little hangar were several heater units connected in series so that we could get air at temperatures approaching 400 C and at 200 psi. These weren't shielded in anyway, apart from insulation jackets. We became a bit concerned when some of the Tungum pipework showed evidence of wall thickness reduction due to corrosion beneath these blankets.

Now to the tasks undertaken there. In an earlier article I mentioned our cockpit air conditioning rig, an almost complete P.1127 fuselage section between front and rear pressure bulkheads with the entire system in its expected locations in the real aircraft. Cooling air for the heat exchangers was ducted into them from a large fan to simulate flight and ground air flows. The cold air unit could be run up to its maximum speed of some 66,000 rpm and all engine bleed air (up to 200 psi) came via the heaters mentioned above. We required, I think, a hot air flow variable up to 18 lb/min regulated by our

own design of pressure regulating and flow control valve. This consisted of a fixed orifice plate with a precisely shaped 'carrot' moving along its axis to vary the area of the flow control annulus. We did all the calculations on this and it was manufactured in-house by profile grinding. John and I used to set these up, matching carrots, orifice plates and springs on the rig to match the theoretical performance we sought. This could be pretty noisy with the in-cockpit levels exceeding 95 db. Mind you, at that time, nobody had begun to challenge the long-term damage caused by this; I am now totally deaf in one ear (but I also did a lot of small-bore rifle shooting...)

Although John and I could make a lot of noise it was (in my opinion) much worse when Roger Samways was testing the reaction control or 'puffer' nozzles. These not only required flows of very hot air at 5 lb/sec to be released as quickly as the valves could be opened and closed (to demonstrate and prove effective sealing and component life) but he also used to sing at the same time!

The other major cause of noise was the hover rig. This was a Dexion frame on which was mounted a black-painted ground board that could be adjusted for height and angle in X and Y axes with a scale model of the P.1127, complete with engine nozzles, fixed above it. This enabled simulated hovers at variable heights and attitudes relative to the ground. In itself it made no noise....until the air supplies were in use. The 'fan' or low pressure compressor air for the front engine nozzles came from our communal 200 psi supply and heaters, whilst the rear high pressure compressor 'hot' engine nozzles, were fed from the noisiest source of all, a Bristol Proteus turboprop engine combustion chamber (or can) that was fired up with its exhaust pointing either outside the hangar or through the rear nozzles on the model. Engine intake suction was represented by something else (I don't know what!) Anyway, the can was so loud that nearby householders lodge complaints and a silencing system had to be devised and installed.

Before running the hover rig, the black ground board was coated with an emulsion of white titanium dioxide in oil to show air flow paths as the engine nozzle exhaust hit the black ground board and potential re-ingestion of engine nozzle air by the engine. Any significant volume of hot air reduces the engine mass flow and, consequently, the thrust produced. It was on this rig that under fuselage strakes were tested and developed.

You have to remember that all this took place between April 1960 and September 1962 when private car ownership was in its infancy. I mentioned John Apter's Hillman Husky earlier; that was the only car in which I have ridden that was equipped with a four point seat harnesses. Ray Searle had a reverse sloping rear-window Ford Anglia 105 E, I had a former Fordson milk delivery van with much modified chassis, suspension and a Rochdale Motor Panels and Engineering GT bodyshell. In shape this was not unlike an E Type Jaguar that hadn't yet been produced - there the resemblance ended. Stan Williams had a Morris Minor, a new model, not a 1930's two seater of which Roger was so proud!

We all used to park alongside the ID Robin Hangar where there were both a hedge and a ditch. One day Roger had a trade visitor who was taking him out to lunch, they were going in Roger's pride and joy. His colleagues had other ideas, however. The fabric hood had only a very small rear window and Roger had parked nose to ditch and hedge. Ready to pop out for lunch he climbed aboard, started up, engaged reverse and moved slowly forward, slipping gently into the shallow ditch despite increased revs. Unknown to him, three of us were bent double behind lifting the rear wheels off the ground and pushing slowly. Of course it was easy enough to extract him! So, you see, the mixture of work, learning and (a little) fun created a pretty good atmosphere and some friendships that have stood the test of time.

Another task with which I was involved was a study of kinetic heating and heat transfer, where I was led by Rene LeClaire. This was in the context of the supersonic P.1154 that was anticipated to be capable of protracted flight at Mach 1.7 (while the fuel lasted) and up to 15 minutes dash at up to M 2.3. This latter was limited by water spray injection into a water boiler to cool the air through the air conditioning system heat exchangers. I did the sums on that and on the weight vs performance balance for cockpit insulation. René did the bulk of the theory on cabin heat loads and between us we devised an approximate method of calculation. We concluded that the nose of a single seat aircraft could be represented by a cone and that the pilot and equipment inside by a frustum of smaller diameter. The space between was the path of cooling air. We produced a report on this (I still have a copy) and designed an electrically heated specimen for tests. Having done that I moved on for the reasons given in my earlier article and missed that work. Since the next government axed the P1154 I have no idea if our work on that was ever of any real value. Does anyone out there know?

## **SEA HARRIER - IN THE BEGINNING**

Chris Farara remembers the early days...

In 1973 and 1974 I worked at Kingston for John Fozard, then Executive Director, Deputy Chief Engineer and Chief Designer Harrier, as his personal Technical Assistant, following Ray Searle who had been John's first TA. At that time the Company was working hard to secure the Sea Harrier programme so a large proportion of John's time was devoted to the project. The basis of the Sea Harrier was, of course, the in-service RAF Harrier but changes were necessary to 'navalise' it and make it satisfy the requirements of the new role. Some were fairly simple like providing tie-down lugs and an independent emergency brake system for deck use and safety, eliminating the few magnesium airframe components for sea water corrosion reasons, increasing roll reaction control power and tailplane travel for improved hovering and transition handling qualities. The big changes were in the avionics fit which included the Ferranti Blue Fox radar, a new digital head-up display and weapon aiming computer, a new attitude and heading reference system, a Doppler radar, a new digital navigation computer and the electrical generation system to power it all. This all had to be housed in the existing airframe.

The radar could have been mounted in the front of the GRMk3 nose, in fact DB Harrier XV277 was flown satisfactorily with a dummy radome, but the Sea Harrier, unlike the ground attack RAF aircraft, would be used in air combat which requires all-round pilot vision. The view aft from the ground attack GRMk3 was poor. The answer would be to raise

the cockpit, a proposal strongly advocated by Lt Cdr Nigel 'Sharkey' Ward, from the Department of Naval Air Warfare, whose project the Sea Harrier was. He was a frequent visitor to John Fozard's office where they would discuss the finer points of the Sea Harrier design. Such a cockpit would be expensive and the Sea Harrier had to be a minimum change and minimum cost aircraft if the Navy was to get the funding for the project. However, John Fozard sold the idea to the Ministry of Defence Procurement Executive by claiming that it was essential to raise the cockpit to provide space beneath it for radar ancillary electronic boxes. The Navy, of course, was in complete agreement.

Sharkey also wanted more space between the pilot's helmet and the canopy to allow increased head movement during air combat. It would be simple and inexpensive to bulge the canopy a bit but John Fozard knew that Roll-Royce Bristol would want to qualify their engine with its intake behind the revised canopy, and such tests would be expensive. John judged that any effects on the intake air flow would be trivial so his solution was to authorise the bulged canopy - but not to tell the engineers at Bristol.

To ensure that the cost of the aircraft was as low as possible John kept his eye on every change from the GRMk3 that his design team proposed. There were frequent informal meetings in his office with whichever specialist or group had a proposal. It was my job to round them up then make notes on what was agreed or what the actions from the meeting were, and then to follow progress. One of John's strengths was that he had a deep knowledge of all aspects of fighter aircraft design so could understand his designers' proposals, argue with them and get the best out of them. He also had a good relationship with the test pilots, particularly John Farley, and would discuss operational and flying aspects with them. The 'Two Ronnies' (Barker and Corbett) had a TV show at the time which featured a pair of spoof detectives, Charlie Farley and Piggy Malone; the Farley-Fozard partnership soon became known by these names in the design organisation.

Before there was a chance of a production contract the Government had to be convinced that the cost was justified. John took a strong interest in this. He personally produced a paper based on his research into the industrial implications of the Sea Harrier project. He examined the value of the Sea Harrier, in terms of employment and tax returns, to all the contractors from British Aerospace, Rolls-Royce, Ferranti, Smiths Industries and other top-level equipment suppliers, through aluminium alloy, steel, titanium and wiring suppliers down to suppliers of nuts, bolts and rivets. He plotted these hundreds of firms on a map of the United Kingdom to illustrate how widespread the industrial and technological benefits would be to the nation. This paper was distributed to Members of Parliament and other influential groups. John also worked with the trade unions who were also promoting the project through their connections with the government.

John was tireless in promoting the Sea Harrier, especially to journalists who would be lined up by the Kingston Public Relations staff and invited to his office for a briefing. John had a gift for explaining complex engineering matters so that non-specialists could understand the problems and solutions. He would sit at the head of the long table in his office with his guests each side. Using a stack of plain white A3 sheets of paper and a black felt tip pen he would illustrate the points he was making and at the end of the briefing would fold up the sheets and hand them over. A favourite theme was that the Sea Harrier was the only fighter that Nelson could have used, illustrated by a sketch of HMS Victory with a platform, built off the stern, over which a Sea Harrier was hovering.

Following the submission by BAe Kingston of a Development Cost plan for the finalised configuration agreement was reached in late 1973 by the government that the Navy could have their Sea Harrier and the programme should proceed. However, "events" intervened: the world fuel crisis, the UK miners' strike, the three day working week, the 1974 general election and government change to Labour. The project was kept going by funding for small studies and it was not until May 1975 that the government approved the development and production of 24 Sea Harrier FRSMk1 aircraft for the Royal Navy. Sharkey Ward got the first squadron (No 700A).....and the rest is history!

## **BOOK REVIEWS**

### **British Secret Projects. Jet Bombers Since 1949. 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 much new information and many new illustrations. There is much to interest the Hawker enthusiast in this book which covers some fifty Kingston projects. A strong point is that it 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 research into original sources that the author has carried out.

### **The Aviation Historian Issue 25.**

Another cracking volume. Of particular interest to Members will be the article, 'Making a Pig's Ear from a Silk Purse' on the procurement F-4K Phantom that was chosen by the Royal Navy, urged on by 'Winkle' Brown, instead of the P.1154. Those of us who like modern projects will be fascinated by the first of a two-part piece on Convair's submissions for the US Navy's proposal for a seaplane striking force. There are, of course, many other articles of general aviation interest including the story of the Yak 28PP electronic warfare variant.

## MEMBERSHIP NEWS

Sadly we record the deaths of Ann Martin, Brian Coombs and Bryman Harman. We send our condolences to their families and friends.

## MEMBERSHIP LIST - October 2018

**Thirty six 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.

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