THE HAWKER ASSOCIATION

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EDITORIAL

Thanks to Richard Cannon I have a new computer up and running so I am editorially functional again. Instead of Windows XP and Outlook Express I now have Windows 10 and G Mail both of which I find over complicated and difficult to use. However, Richard is just a phone call away and with great forbearance and Teamviewer he cheerfully answers my questions.

In this issue you will find the AGM report, accounts of two very different talks and a contributions from an ex-employee who worked at Kingston in the EDO. Contributions from Roy Evans and Brian Indge will be published as space allows and there will be more from Graham James and Brian Buss.

Several 2019-2020 subscriptions are overdue - see names in bold on the back page.

Please send your Newsletter **contributions** to The Editor, Chris Farara, 24 Guildown Road, Guildford, Surrey, GU2 4EN or e-mail to cjfarara@ntlworld.com. Tel 01483 825955.

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PROGRAMME FOR 2019

Wednesday 10th July	The Joint Strike Fighter Story - **Mick Mansell.**
Wednesday 14th August	Social/video
Wednesday 4th September	Outing - visit to **Surrey Satellite Technology** Ltd, Guildford. (See below).
Wednesday 11th September	Social/video
Wednesday 9th October	Hawker Non-V/STOL jet Projects - Tony Buttler
Wednesday 13th November	Royal Navy Historic Flight - Lt Cdrs Mark Jamerson/Chris Goetke
Wednesday 11th December	Christmas Lunch

Mick Mansell was Executive Director Design at Kingston and Director of Future Systems at Warton, and **Tony Buttler** is a well known aviation author with a special interest in British jet projects.

Details of the arrangements for the outing to **Surrey Satellites** will be communicated by e-mail. To book a place please e-mail Chris Farara at cjfarara@ntlworld.com. SSTL is the world's leading small satellite company, delivering operational space missions for a range of applications including Earth observation, science, and communications. The company designs, manufactures and operates high performance satellites and ground systems for a fraction of the price normally associated with space missions. Based in Guildford UK, SSTL is an independent company within the Airbus Group. The trip will include a presentation on the history of the company and a brief insight to the future of the space business as SSTL sees it. This will be followed by a tour of the buildings, including the satellite control room and the facility where satellites are assembled.

Details of the Christmas Lunch will be communicated by e-mail as well as via the Winter Newsletter.

TOMMY SOPWITH 1932 - 2019

It is with sadness that we report that Sir Thomas Sopwith's son,Tommy Sopwith , died peacefully aged 86 on May 4th. Tommy has been a high profile supporter of the Kingston Aviation Centenary Project from the very beginning when he opened the Kingston Aviation Festival in Kingston Marketplace in 2012. Tommy was a keen motor car and powerboat racer. He had considerable success in a Cooper-Climax before being runner-up in the first British Saloon Car Championship in his Jaguar in 1958 and winning the first Cowes to Torquay International Powerboat Race in 1961.

ANNUAL GENERAL MEETING 2019 REPORTS

Chairman's Report

Chris Roberts said that the committee has continued to follow the aims of the association and to fully support the Members. The most obvious deliverable is the monthly programme and we have had another successful year of events and speakers. The YMCA maintained their high standard for the summer barbecue and the Christmas lunch. The annual visit was to the Harrier Heritage Centre at RAF Wittering where we were made very welcome; for many it brought back fond memories of the Harrier and in-service support.

Behind the scenes the Committee has kept pace with the administration of the Association. This past year we have wrestled with the new EU General Data Protection Regulation to find a compromise way through legislation that was not designed for organisations like ours. Our web space supplier TalkTalk gave us very little notice of withdrawal of the service, but one of our Members, John Gardner, came to our rescue by offering us the use of web space within his business site.

After holding the subscription at £5 since the Association began, we have had to succumb to inflation and increase it to £7 to recover financial ground and keep us healthy for the next few years. This represents around only 2% per annum in an environment where costs have increased significantly. We all know how much Royal Mail has increased the price of stamps and we had to accept printing costs that were originally covered by BAE Systems when the newsletters were printed for the Association at Farnborough.

In the past year Members have made good progress with the restoration of Hunter T7, XL623, and soon we will be applying for planning permission for the proposed site in Kingston, facing the old factory site on Richmond road next to the fire station. We have also assisted with the acquisition of G-HAWK/ZA101 for Brooklands where it can now be found next to G-VTOL, and we have helped to save XX154, the first Hawk from being lost to the nation; it was either going to be broken up for spares or exported.

Membership has ebbed slightly to 339. The committee will continue to try to keep membership level up but we will need your help to put out the word that the Association is good value! I conclude by reminding you that it is your Association; the Committee works for you. Our ears are always open for input and comment.

Secretary's Report

Barry Pegram, after announcing the ten apologies received, reported that the Membership stood at 339, well short of the ambition to reach 400. Of these 220 are 'local', 102 are 'distant', 17 are overseas, 48 are ladies and 23 are Affiliates unchanged from last year. Eight Members have not responded to renewal notices for two years so will be removed from the Membership list, and sadly twelve Members have died. There were five talks (with one cancelled as it clashed with the John Farley memorial event at Brooklands in October): Ed Hui on paper aeroplanes (33 attendees), Dick Wise on Ernest Hemingway (30), David Hassard on the Surrey aviation industry in WW I (42), Chris Roberts on historical aspects of flight (44) and Ambrose Barber on his post-retirement activities (30). The AGM was attended by 22, the visit to the Harrier Heritage Centre at RAF Wittering attracted 24, 30 came to the barbecue and 48 to the Christmas lunch. The three socials drew 19, 21 and 21.

Treasurer's Report

Martin Pennell was unable to attend so his report was presented by Barry Pegram. Income followed the usual pattern of subscriptions (£1726) and raffle takings (£512). Principal expenditures were venue hire (£500), stationery and postage (£1187), speakers' expenses (£84), raffle prizes (£85) and insurance (£379). The barbecue, Christmas lunch and Wittering visit were essentially self financing. A donation of £2000 went to the Brooklands Museum for the restoration of P.1127 XP984 and other Hawker projects. The finances with a bank balance of £2459 at Dec 31st 2018, were in an acceptable state and it was expected that this position would be maintained following the subscription increase for 2019.

Discussion

Frank Rainsborough suggested that short (3 - 10 minutes) informal talks on Members' interests would be attractive at Socials.

David Hassard raised the question of Affiliates. He suggested that the personal approach might be effective in attracting new members; invite interested people to join, bring a guest to a meeting, contact old colleagues, give them a Newsletter.

The cost of postage continues to rise. Perhaps Members would accept e-mailed Newsletters?

Electronic payment of subscriptions was being considered by the Committee.

The publishing of booklets on Sopwith and Hawker was suggested.

HUNTER T7 XL623 PROJECT UPDATE– JULY 2019

Chris Roberts reports on progress…

This month, July 22nd marks the anniversary of the Hawker Association taking ownership of XL623 after it was lowered off the mounting pole in the centre of Woking town

The two aspects of the project, the airframe and Kingston installation are both progressing. The aeroplane restoration is well underway, and arrangements for a display site in Kingston are well matched to the airframe progress. Although a formal approval for a site in Kingston has not yet been obtained we will be submitting a planning permission application in the next few months, and this will flush out the rest of the issues that need to be addressed. Meanwhile the civil engineering drawings for the installation are being reviewed and updated. The foundation (forgive the pun) of the works being the original plans that were used in Woking 25 years ago.

Work on the airframe continues at two locations. At Dunsfold work on the centre section of the fuselage is underway and it will be detached from the front (nose section) when it needs to be moved to Brooklands. Some work has been carried out on the nose section and the wings have also had some initial attention. The wings, tailplane and nose cone need relatively little work as the structures are sound so the requirements are broadly for preservation and cosmetic needs. The rear and centre portions of the fuselage were where the main recovery work was needed because years of water ingression mixed with bird droppings produced a very corrosive mixture. The rear section at Brooklands is now in final preparation for painting, so we are looking forward to moving the centre section to the museum to start the re-skinning of the bottom portion.

A year ago when we had the first close inspection of what we were going to have to deal with we were sure that the restoration was achievable, so again we thank all our donors for their support and confidence. Work on the airframe will continue and we have sufficient funds to meet our immediate needs. However, ongoing support is needed so again we ask for donations. As before please send them to myself at 3 Sole Farm close, Bookham, leatherhead, Surrey, KT23 3ED or to Paul Rash at Rowallon Lodge, Farnham Lane, Haslemere, Surrey, GU27 1HE, with cheques payable to 'The Hawker Association Hunter Project'. A BACS transfer directly into the project bank account might be easier: 30-84-46 36893268 with your name as a reference so we can get back to you.

The ground installation will be the subject of a separate fund raising exercise. The sum involved suggests that it would be appropriate to lobby Kingston's business community for support. However, the planning application fees may need to come from the restoration funds because it is the only practical way to launch the application. We expect these fees to be about £500, a sum that we can just cover. But we do need a little more help to keep moving forward!

FIRST HAWK RETIRES

XX154, the first Hawk TMk1, made its final flight on December 19th 2018. First flown on August 21st 1974 by Duncan Simpson it remained with the HSA/BAe Hawk development fleet at Dunsfold until January 1982 when it was transferred to the Ministry of Defence who posted it to Llanbedr where it was used to support trials on the missile range. Latterly XX154 was part of the Empire Test Pilots' School fleet at Boscombe Down.

AUSTRALIAN HAWK UPGRADE

BAE Systems Australia has completed the capability upgrade on the Royal Australian Air Force (RAAF) Hawk Mk127 advanced trainer aircraft fleet at its Williamtown maintenance facility. Engineers in the UK and Australia, as well as RAAF technicians, were involved in the 33 aircraft programme. With this upgraded Hawk, the RAAF has a lead-in fighter that is ready to train pilots for the F-35A Joint Strike Fighter. The Hawks provide new training capabilities including simulated radar, electronic warfare, digital mapping, ground proximity warning and traffic collision avoidance. The upgrade also includes the replacement of two synthetic training devices with three full mission simulators provided by Australian defence contractor CAE

The Hawk Mk127 fleet has been an integral part of the RAAF's fast jet training system since 2001 and is operated by 76 and 79 squadrons at the Williamtown and Pearce bases. Over the years the fleet has delivered trained aircrew for Hornets, Super Hornets and Growlers. BAE Systems has been awarded a contract extension to continue to sustain the RAAF Hawk fleet until at least 2022.

HAWKS IN SAUDI

Saudi Arabia rolled-out the first of 22 domestically manufactured BAE Systems Hawk Mk 165 Advanced Jet Trainer (AJT) aircraft during a ceremony held in April. The event at the King Abdulaziz Air Base marked a major milestone in the country's Vision 2030 programme for technical expertise and economic growth. Already an operator of Mk 65 and Mk 65A Hawks, the Royal Saudi Air Force (RSAF) ordered its first replacement batch of 22 Mk 165 AJT aircraft in 2012, with deliveries beginning in 2016.

'THE LAST OF THE MANY' NEW COLOUR SCHEME

Long time Langley and Dunsfold resident, PZ865, the last Hurricane built and donated to the Battle of Britain Memorial Flight by HSA, will, after an imminent major service be given yet another spurious paint scheme. This time it will be all black, representing IIc night fighter BE634 ZY-V for the 2020 display season.

BAE SYSTEMS TEMPEST PROJECT

Once again, vis Tornado and Typhoon, BAE Systems has chosen a Hawker name for a new UK combat aircraft, the Tempest, whose development was announced last year. At Farnborough, Secretary of State for Defence, Gavin Williamson, said that £2bn would be invested in the development of Tempest up to 2020, and BAE Systems would lead development with Rolls-Royce contributing engines, MBDA integrating weapons and Leonardo developing sensors and avionics.

The plan is to finalise design in the early 2020s, produce a flyable prototype by 2025 and have the aircraft entering service by about 2035. By that time, Typhoons are likely to have many flying hours still in reserve and those in service will be phased out gradually over five to 10 years. In the meantime, many of the systems which will be developed for Tempest are likely to be first in service on upgraded Typhoons.

ROYAL NAVY HISTORIC FLIGHT

The Royal Navy Historic Flight, Founded in 1972 and based at RNAS Yeovilton, stood down on March 31st 2019. It has displayed some of Britain's most iconic naval aircraft, including the Swordfish, Sea Hawk, Sea Fury and Firefly. Over the next few months responsibility for maintaining and flying the aircraft is being transferred to the charity Navy Wings, securing their long-term future, flying as civilian rather than military aircraft. The charity has supported the Flight for over 25 years with annual grants and donations. Additionally, the charity has supplemented the Flight with its own naval heritage aircraft, including a Hawker Sea Fury and de Havilland Sea Vixen.

FRESH INTERESTS AND RESPONSIBILITIES

On March 13th Ambrose Barber talked to Members about what he had been up to after retiring from BAe, having worked for HAL and HSA since the 1950s in roles ranging from flight development engineer and flight observer to divisional director. His new interests included the musical theatre, owning a classic light aircraft, researching his family history, creative writing, and sculpture, all of which were illustrated in the talk.

Ambrose played no musical instruments but had a keen interest in the operas of Gilbert and Sullivan (G & S). This led him to join the Godalming Operatic Society in 1971, while still working, to become a member of the chorus at the age of forty. The Chairman was Dunsfold aerodrome Manager, Fred Jeffery. Fred retired to Dorset when Ambrose was too busy to take on the responsibility but when he retired he had no such excuse, becoming Chairman in 1998. The Society staged a G & S opera with full orchestra every year, costing £30k or more, with performances at the Godalming Borough Hall and the Civic Hall Guildford. When the latter closed the Thorndike Theatre at Leatherhead was substituted. Often summer performances were also staged. Although an amateur Society the soloists were of professional standard and there was keen competition to recruit the best. The Society had built up a high reputation for the quality of its productions since its foundation in 1924 and it was Ambrose's job to ensure that the reputation was maintained.

Initially the classic light aircraft was a 1946 Blackburn Cirrus powered Auster owned by a neighbour who wanted to share it. Ambrose bought a share and they flew from a local farm. The grass strip had a significant slope with trees at the top so it was essential to take off downhill and land uphill. Wind speed and direction were critical. On returning from one sortie Ambrose found that the wind had changed direction but decided to 'have a go' at landing. The result was major damage to the wing a bit less to the fuselage and the engine was OK. The Auster was rebuilt. This machine was sold, a third member was recruited to form the Southdowns Auster Group and a more powerful DH Gypsy powered Auster J1N (G-AHHT) was bought. Flying some 12 to 15 hours per year with shared ownership is less expensive than flying at club rates.

An interest in his family history led Ambrose to go on a researching course. He found that his was originally a West Country family from a hamlet on the banks of the Severn called Cambridge; hence Ambrose's middle name. He has traced the family back to 1796 and has inherited a light cavalry sword from that era. Nowadays DNA can provide extra information by comparing a sample with a databank available via the internet.

A one week course on creative writing helped Ambrose to write a new operetta for the Godalming Operatic Society. He based his story, 'A Frank Affair', on the 'Franklin's Tale' in Chaucer's Canterbury Tales. Set in the 1950s it was performed at Guildford's Electric Theatre. Ambrose has also written chapters in the nostalgic aviation series which included 'More Tails of the Fifties', 'Tail Ends of the Fifties' and 'Shadows of the Fifties' (Ed's note - all compiled by Peter G Campbell and published by Cirrus Associates, these are all excellent reads). In the former he wrote about his experiences as a National Service pilot trainee in the early 1950s, a time when the casualty rate is now recognised as having been appallingly high for peacetime. Ambrose was lucky to be selected as a Vampire pilot as a total of 890 Meteors crashed. Consequently Ambrose flew on for 64 years stopping only when he reached 85!

A more prolonged course, this time at the West Dean College, Chichester, got Ambrose started on sculpture. He proved to have a talent and amongst his successes is a bronze bust of Sir Sydney Camm commissioned by the RAF Club in Piccadilly. Further castings are on display in the Royal Borough of Windsor's Guildhall Museum (Windsor was Camm's birthplace) and at the Royal Borough of Kingston's Library/Museum. Ambrose's bronze bust of Sir Thomas Sopwith is on display at the Kingston Library/Museum and also at the Royal Yacht Squadron, Cowes (Sopwith was a keen and distinguished America's Cup challenger).

The vote of thanks was given by Editor Chris Farara who had known Ambrose since joining Fred Sutton's Flight Development department at Dunsfold in 1961; in fact Ambrose was his 'mentor'. Chris had also flown with Ambrose in a variety of aircraft including the oldest Tiger Moth on the civil register, G-ACDC, in which he experienced his first aerobatics and spins!

FROM KITES TO THUNDERBIRDS

On February 13th our Chairman, Chris Roberts, standing in for Lt Cdr Chris Goetke, entertained Members with his comprehensively illustrated personal take on aviation pioneers. He had this talk in stock from his days as a lecturer on cruise ships including the Queen Mary - nice work if you can get it!

In 478 BC, Chinese philosopher Mo Zi spent three years building a wooden Hawk kite, or Fen Zheng in Chinese. In 200 BC General Han Hsin flew a kite above a fort he was attacking to measure tunnelling distances.

In Europe, Lenardo da Vinci (1452 - 1519) drew a number of flying machines including a man powered ornithopter, a flapping wing device; none were built or flown.

Joseph Montgolfier (1740 – 1810) and his brother Jacques (1745 - 1799) were paper manufacturers in France, and became famous as inventors of the Montgolfier-style hot air balloon. They launched their first unmanned balloon on the 4th June 1783. The first living creatures to fly were a sheep, a rooster and a duck in a larger balloon on 11th September; the landing was safe and the animals survived. The brothers then built a more elaborate and much larger balloon in which Etienne became the first man to rise from the surface of the earth reaching a height of 80 ft, the length of the tether, in October. The first free flight was on 2nd November when Pilatre de Rozier and the Marquis d'Arlandes made a 25 minute flight near Paris.

Jacques Charles pioneered the hydrogen balloon, his first being launched on 21st August 1783 with the first manned flight by Charles and Nicolas Robert on December 1st. Charles went on to conceive the dirigible (steerable) balloon.

Moving on to fluid dynamics Chris cited Daniel Bernoulli (1700 - 1782), a Swiss mathematician whose 'principal', that in a moving stream of fluid static pressure plus dynamic pressure is a constant, is the foundation of theoretical aerodynamics and explains how a wing develops lift.

English aristocrat Sir George Cayley (1773 - 1857), a prolific inventor and the 'father of aeronautics', was the first scientific aerial investigator. He was the first man to understand and state the forces on a body moving through the air: thrust, drag, lift and weight, to realise the importance of stability and control, to conceive the aerofoil section and to devise the modern configuration of fuselage, wing and tailplane. He designed and built a steerable glider incorporating these principles. In 1849, near Scarborough, it was launched downhill with his coachman on board, becoming the first manned heavier-than air machine to fly.

German engineer Otto Lilienthal (1848 - 1896) studied bird flight, built a series of 'hang gliders' and was acknowledged as the first successful aviator before he was killed in 1896 in a crash.

Samuel Langley (1893 - 1903), a prominent American scientist and astronomer, successfully flew a number of tandem wing models and his attempts to fly the full scale internal combustion powered, somewhat fragile, 'Aerodrome', from a pontoon in the Potomac River, almost succeeded in the hands of pilot Charles Manley. However, it crashed into the river immediately after being launched. The US War Department had spent $50,000 on the project.

American civil engineer, Octave Chanute (1832 - 1910), became interested in aeronautics and compiled a valuable compendium of all aviation research to date, 'Progress in Flying Machines'. He designed and built a number of biplane hang gliders and a 12 winged version. He inspired the Wright brothers and was a great teacher and helper of pioneer aviators.

Next came the Wright brothers, Orville (1871 - 1948) and Wilbur (1867 - 1912), bicycle makers from Dayton, Ohio, USA who were the first to design and build a powered, manned, aeroplane capable of prolonged, sustained, controlled flight. Their work was underpinned by research using their own wind tunnel; they designed proper propellers and a light-weight piston engine. They built and flew a number of biplane kites and gliders, beginning in 1900, and developed the wing warping method of roll control which in conjunction with rudders and elevators provided three axis control. Their experimental work culminated in the 'Wright Flyer I' which on December 17th 1903, with Orville aboard, made an historic 12 second flight of 120 ft.

In Europe, Alberto Santos Dumont, a Brazilian living in Paris, was successfully building and flying balloons and dirigibles. He turned to aeroplane design and on October 23rd 1906, in his canard biplane '14 bis', made the first powered heavier than air flight in Europe. In 1908 his tiny 'Demoiselle' monoplane was the first production aircraft being sold already built or as construction plans.

The first man to fly a heavier than air machine in England was American born rodeo performer, Samuel Cody (1867 - 1913). Starting as a military kite builder he progressed to his 'British Army Aeroplane No 1' which he first flew on October 16th 1908, at Farnborough.

In France Louis Bleriot (1872 - 1936), from 1907 designed and developed successful monoplanes in one of which he flew across the English Channel in 1909.

In May 1919 the first flight across the Atlantic was made by the US Navy Curtiss NC4 seaplane with 21ships marking the route from Newfoundland to the Azores. NCs 1, 3 and 4 had set out from Newfoundland but only NC4 made it to the Azores and on to Lisbon in Portugal. The first non-stop Transatlantic flight, from Newfoundland to Ireland, was made by Captain John Alcock and Lieutenant Arthur Whitten-Brown in June 1919 in a Vickers Vimy. In May 20th 1932, American aviatrix Amelia Earheart made the first solo Transatlantic flight by a woman from Newfoundland to Northern Ireland, in her Lockheed Vega 5B.

In 1927 Frank Whittle produced his theory for jet propulsion by a gas turbine engine but it took six years for his ideas to be accepted by the British 'establishment'. Nevertheless he ran his first engine on April 12th 1937. The event nearly ended in disaster as the engine ran away, overspeeding, but prompt action by Whittle saved the situation. The engine was flight tested in the tail of a Wellington and powered Britain's first jet aircraft, the Gloster E28.39, which flew on May 15th 1941. This led directly to Gloster's Meteor, the RAF's first jet fighter.

The first manned supersonic flight was by the USAF's experimental rocket powered Bell X-1 on October 14th 1947, flown Captain 'Chuck' Yeager and launched from a Boeing B-29 bomber. The design was based on the shape of a bullet, which was known to be stable at supersonic speeds, with thin, straight wings. In Britain the Miles M.52 project for a Whittle jet powered supersonic aircraft was cancelled by the Government but its design features, including the innovative all-moving slab tailplane designed to provide adequate pitch control at supersonic speeds where conventional elevators would be ineffective behind the shock wave, were passed to Bell.

Again in America, aviator, aircraft company founder, industrialist and film producer, Howard Hughes, built the world's largest aircraft, his eight engined, wooden H-4 Hercules flying boat, nick named the 'Spruce Goose'. It was designed to carry 750 troops or two Sherman tanks, had a wing span of 320 ft and was 219 ft long (the A380-800 has a span of 261 ft and a length of 238 ft). To get paid for by the Government the H-4 had to fly so on November 2nd 1947 Hughes took off from Long Beach harbour and flew for one mile, the H-4's only flight.

To avoid Company bureaucracy Kelly Johnson set up his flexible and quick reacting 'Skunk Works' cell within the Lockheed organisation to quickly design and build. He produced the XP-80, America's first really successful jet fighter, taking just 21 weeks from start to first flight. Other notable Skunk Works aircraft included the high flying U2 'spy plane' and its strategic reconnaissance successor, the stealthy SR71 which flew in 1964. This was and still is the fastest production aircraft ever, cruising at Mach 3.2 and 80,000 ft, well out of reach of Soviet defences. It was powered by two Pratt & Whitney J58 engines burning smokeless JP7 fuel.

Project Mercury was America's first manned space flight programme in which six astronauts flew earth orbits in a McDonnell capsule. Alan Shepard was the first to fly on May 5th 1961 (being pipped at the post by Russian Yuri Gagarin on April 12th), then came Virgil (Gus) Grissom, John Glenn, Scott Carpenter, Walter Shirra and Gordon Cooper. Their exploits were the subject of Tom Wolfe's book 'The Right Stuff' (later a film) and the names of five of the astronauts were immortalised in Jerry Anderson's TV puppet series 'Thunderbirds' where Alan, Virgil, John, Scott and Gordon were principal characters……..So….kites to Thunderbirds!

THE HARRIER IN 1/48th SCALE - Part 1

Harrier modeller Graham James tells us about his hobby…

At the March 2018 meeting I brought along some of my scale model collection following a request from Frank Rainsborough to see my interpretation of Harrier GR.5 ZD402 (the aircraft used for the Pegasus 11-61 trials, as many of you will no doubt already know). A few people viewing the models asked me why did I build Harriers and other Hawker aircraft. Now that my Harrier collection can be seen on the web, it made sense to provide some background and Chris Farara has kindly agreed to include this article in the newsletter.

Where did it all begin? I started model making as a young boy - which is where most model makers start of course - and built mainly aircraft, primarily modern (at the time!) jet fighters and airliners. Living under the flight path for Heathrow ensured an interest in the latter. I also dabbled in tanks, F1 cars, ships and WW2 fighters. Other interests as a teenager soon meant the hobby was all too quickly forgotten, though I did retain an interest in military aviation and even considered a career as a pilot in the RAF. I ended up in information technology and as a result got nowhere near aircraft. .

Around the end of 2009 I had my "James May Moment" - where you revert to your childhood - and decided to build a model or two to see if I could rekindle my old interest in the hobby. A 1/72nd scale Spitfire, Harrier and Mosquito quickly followed and I was hooked. Knowledge, techniques and skills were certainly rusty, but the fires of enthusiasm had been re-lit. Around the same time, and not entirely coincidentally, I had begun volunteering at Brooklands Museum, working as a steward in the Wellington Hangar, the home of a certain jet aircraft that will be very familiar to many of you. It was all part of a half-formed idea to change careers and see if I could get a job somewhere in the aviation industry. This idea came to nothing in the end.

An early decision when re-starting the hobby was not to build anything and everything but to have a project focus (work habits die hard) and thus began a few weeks of looking at what was available and more importantly, what clubs or interest groups could help with research materials and support. The Harrier was high on the initial lists of possible subjects as I've always been interested in it and it so happens that there was a very active IPMS (International Plastic Modellers' Society) SIG (Special Interest Group) dedicated to the Harrier. The aircraft was also still in service, so I could take my own photographs (another hobby) for research purposes. And of course there was Brooklands and G-VTOL and XP984.

A decision was quickly made and some kits bought before I could change my mind and create the beginnings of every model maker's wife's nightmare - the "model stash". In case this is an unfamiliar term, this is the little boy part of the hobby where we begin buying and storing every kit that we think we want to build, irrespective of whether we have the time or the interest to do so, at a later date. Before we know it, we have a loft full of non-standard loft insulation that will rarely see the light of day and will probably be recycled for less money so that other kits can then replace them. It does however give us bragging rights with fellow model makers - "my stash is bigger than your stash" etc., if my experience of listening to conversations at model clubs and shows is anything to go by. I chose 1/48th scale because I think it's a nice compromise between size (not too big, not too small) and aesthetics. It is also better for failing eyesight in old age and oversized fingers and thumbs.

I decided that the scope of my project, based on current kit availability, would be to build an example of each Harrier single-seat variant that served with each service. Using my knowledge at the time and some artistic licence, I chose this group: RAF - GR1, GR3, GR5, GR7, GR7A, GR9, GR9A; RN - FRS1, FA2; USMC - AV-8A, AV-8C, AV-8B, AV-8B NA, AV-8B Plus; Indian Navy - FRS51; Spanish Navy - AV-8S, EAV-8B, EAV-8B Plus; Italian Navy - AV-8B Plus; and Thai Navy - AV-8A. As I began building, the correctness of what should have been included became academic as I started building others outside of this group! The bug has truly bitten. *To be continued.*

HAWKER AIRCRAFT LTD IN THE 1950s - Part 1

Brian Buss remembers his often frustrating 13 months in the Hawker Experimental Drawing Office (DO) at Canbury Park Road in the time of the P.1121...

I found the train journey to Kingston via Clapham Junction took about an hour and a quarter which I imagined would not be pleasant at times and later I was proved to be right. I reported on January 1st 1957 to Frank Cross's office and was joined by Digger Fairey who was the senior section leader in the Experimental DO. At first they did not know whether I should be placed on the design of the variable wedge intake to the single DH Gyron 27,000 lb thrust engine of the P.1121 Mach 2.2 interceptor fighter, or on the design of its 69 degree swept fin. I was very pleased when they settled on the fin as the intake looked extremely complicated.

I was allocated a drawing board and table immediately inside the DO in line with those of Digger Fairey and Jack Simmonds overlooking the whole of the DO engaged on the design of the P.1121. Digger's section had designed the main centre fuselage now under construction at the Richmond Road site, some two miles away. Jack was responsible for the cockpit and forward fuselage design.. In this respect I was astounded to see articles and photos being used as a design guide depicting cockpit details of Convair's two fighters, the F-102 Delta Dart and the F-106 Delta Dagger, both of which were flying at the time.

There were at least two other section leaders in the same DO that I recall: Derek Campbell responsible for the wing design and Ben Capper in charge of electrical systems. There were others on the floor below, one of which was Roy Slade in charge of powered controls who I had to deal with as the fin housed the rudder actuators.

Digger Fairey's section was then designing the rear area ruled fuselage with some difficulty. Very little room remained for the rear frames between the outer skin and the large tailpipe of the Gyron with its afterburner. In places the frame depth could barely exceed four inches. I do not recall whether this situation demanded the use of titanium for it was decided from the outset to use this material for the first time at Hawker. Titanium was known to be lighter and stronger than aluminium but few UK aircraft companies had experience in working with it. Consequently it was found that working practices had to be drastically changed and much experimentation and testing were undertaken at a very late stage in the construction of this prototype. My concern of course was the design of the fin spars where they attached to the rear fuselage frames.

To a large extent the basic design of the fin was determined for me. Production of high tensile steel in the UK was at that time limited and directed to military projects on a priority basis. As the P.1121 was a PV (private venture or company funded) project supplies of this type of steel had to be sought elsewhere. A Belgian supplier had been found but to have the material when construction commenced the order had to be placed some 15 months in advance. Hence someone had to estimate the size and shape of the various forgings well before the fin was designed in any degree of detail. Forgings were required to ensure the grain of the material flowed in the correct directions to gain maximum strength and to avoid the onset of cracks.

So one day I was presented with drawings of three huge steel forgings which I had to incorporate in my design. Digger Fairey had made the initial estimate for placing the order and although some detail difficulties arose a design evolved in which all could be used. For the first two months or more my section consisted of one, myself, although others joining me at this stage would not have helped. Much of the basic layout had to be schemed and initial stressing carried out by Rob Robbins, a member of the Stress Office allocated to the fin.

My first week or two in the DO was, however, somewhat hectic. In the first two or three days I downed tools at the correct time and was away to catch my train. Shortly after I was called into the office by the Assistant Chief Draughtsman, Harry Tuffen. I was asked why I was not working overtime. My answer was because nobody had informed me it was expected. Most staff was said to work an additional hour on Tuesdays, Wednesdays and Thursdays. I said I could not make one as I went to night school but would stay the other two, for no payment of course as I was salaried. After staying for a week or two I found that nobody really worked. Frank Cross was rarely to be seen, Harry Tuffen read the evening newspaper the whole time, others read books or technical magazines and some disappeared.; so I decided not to continue to stay on. Again I was called into the office but this time I gave my reason and said if everybody worked the additional hour I would stay on. Dear Harry was flabbergasted, and that was the end of my overtime. *To be continued*

BOOK REVIEWS

The Aviation Historian

In issue 27 Richard Seth -Smith, son of Hawker test pilot Kenneth Seth-Smith killed in a Typhoon accident, tells the full story of that aircraft's rear fuselage structural problems as uncovered by Hawker and the RAE. Other articles that caught the Editor's eye cover the politics of the Concorde by Prof Keith Hayward, Willy Messerschmitt's post war jets, Leslie Baynes supersonic swing-wing projects of the 1940s and an improbable French jet powered rotary wing aircraft of 1910! - yes, really. Issue 28 included a Keith Hayward article on the politics of the Airbus A300 and its rivals from BAC. (In Issue 29 he will cover the politics of the P.1127), aero medical aspects of the vertically launched Bachem Natter and the UK development of heavy airborne cannon from 1914 to 1939.

MEMBERSHIP NEWS

Sadly we record the deaths of Leslie Phipps, Peggy Remington, Harry Webb and George Woods. We send our condolences to their families and friends. We welcome new Members Angela Bailey (daughter of Frank Murphy), John Baker and John McKillion.

MEMBERSHIP LIST - February 2019

Subscriptions for 2019 - 2020 (£7) are overdue from those in bold below. Several Members have not yet paid their 2018 - 2019 subscriptions (£5). Their names are in bold in the last Newsletter, No 53. 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:** Angela Bailey, Brenda Bainbridge**,** John Baker, Lyn Baker, Colin Balchin, Edward Banstead, **Ambrose Barber,** Justin Barber, **Derek Barden,** Peter Barker, Graham Bass, **Donald Bateman**, Richard Bateman, Ken Batstone, Dennis Baxter, **Francis Bebbington,** Colin Bedford, Peter Bedford, Brian Bickers, **John Blackmore**, **Andy Bloomfield**, Melvyn Bluck**, Keith Bollands,** Paul Boon**,** Betty Bore, Pat Bott, Steve Bott, Bob Bounden, Mike Bowery, Alan Boyd, Roy Braybrook, Laurie Bridges, Arthur Brocklehurst, Peter Brown, Christopher Budgen, Reg Burrell**,** Robin Burton, Clive Bushrod, Tony Buttler, Dave Byford. **C:** Richard Cannon, Chris Carter, Tom Casey, Bob Catterson, Colin Chandler, Laureen Chapman, **Keith Chard,** John Chitty, **Martin Churms,** Gerry Clapp, JF Clarke, John Cockerill, Hank Cole, David Collingridge, Nigel Cook**,** Jonathan Cooper, Patricia Cosgrove, Ron Cosgrove, **David Cotton,** Nick Cox , Mike Craddock, Shirley Craig, Richard Cripps**, Russ Culley,** Richard Curling. **D:** Clive Dalley, Andy Dalton, John Danse, **Afandi Darlington,** John Davie, Jo Davies, Trevor Davies, Michael Davis, **Diana Dean**, **Ralph Denning,** Wilfred Dimsdale, **Mike Diprose,** Lambert Dopping-Heppenstal, Cliff Douthwaite**,** Bill Downey, **Barry Dreghorn, Mike Drew,** Gwen Duke, **Graham Dunn,** Gordon Dunne, Chris Dunhill, Mike Dyke. **E:** Andy Edwards**,** Barry Elliott, Stephen Elliott, Tony Elliott, Celia Evans, Norman Evans, Roy Evans. **F:** Russ Fairchild, Ian Falconer, Mike Fantham, Chris Farara, Adele Farley, John Farrow, Max Fendt, Ian Ferguson, Stan Field, **Geoff Fieldus, Mike Finlay,** Wilf Firth, Richard Fletcher, Moira Flint, **Ted Forster,** Mike Frain**,** Steve Franklin, Howard Freeman, Geoff French, Mike French, Heinz Frick, **Peter Frost**. 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