



NEWSLETTER 66- Spring 2023

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EDITORIAL

Some of you will know that I was seriously ill from just before Christmas and spent several weeks in hospital in intensive care and in a medical ward followed by a long stay in a rehabilitation centre finally being allowed home in late April, underweight and physically very weak. This halted work on the Spring Newsletter. When I was well enough to work on NL66 my computer would not start or run properly and I feared that my documents had been lost. However our computer genius, Richard Cannon, managed to repair my machine...and save my documents. Thank you Richard.

Sadly, Ralph Hooper died in December and you will find an appreciation of his life and work below.

Send your contributions to the Editor, Chris Farara at cjfarara@gmail.com or by post to 24 Guildown Road, Guildford, Surrey, GU2 4EN. Phone 01483 825955.

SUBSCRIPTIONS REMINDER

There are still a number of 'Members' who owe subscriptions for last year or earlier, as well as this year. Please note that if the Membership Secretary Diana Dean (01483 810030) does not hear from you in the near future it will be assumed that you do not wish to continue with your membership. Thank you.

PROGRAMME FOR 2023 (TBA: to be arranged, TBC: to be confirmed)

Wednesday January 11 th	Chris Roberts - Hawker Hunter for Kingston
Wednesday February 8 th	Angela Bailey - Frank Murphy Part 2
Wednesday March 8 th	David Hassard - Thomas Sopwith and his Aviation Company
Wednesday April 12 th	Lambert Dopping-Heppenstal - Aviation, What Next?
Wednesday May 10 th	Annual General Meeting followed by video of Ralph Hooper's RK Pearson lecture 'The Jet Age'
Wednesday June 14 th	Barbecue at the YMCA Hawker Centre
Wednesday July 12 th	TBA, possibly part 2 of RSH's RKP lecture
Wednesday August 9 th	No meeting
Sunday September 10 th	Visit to Dunsfold Aerodrome with picnic.
Wednesday 11 th October	Chris Wilson - Jet Art Aviation, part 2
Wednesday 8 th November	Nick Anderson - RAF and Virgin Captain - subject TBA
Wednesday 13 th December	Christmas lunch at the YMCA Hawker Centre.

Angela Bailey is Frank Murphy's daughter and has researched his life. Chris Wilson is the Managing Director of Jet Art Aviation, providers of museum standard aircraft restorations. Lambert Dopping Heppenstal had a long and varied career at Kingston and Warton., Nick Anderson was an RAF Phantom pilot and Virgin captain.

Barbecue, from midday with food from 1 pm. Price as last year at £18 per person, visitors welcome. Please send your cheques payable to The Hawker Association to Ken Batstone (01932 2299380) at 42 King's Road, Walton on Thames, KT12 2RA by June 12th.

Dunsfold visit to see the restoration Hunter XL632 etc. Details are to be settled but may well include a marquee and picnic but bring your own chairs. Let Diana Dean know on 01483 810030 if you are interested. There will be a small charge.

ASSOCIATION ONLINE VIDEO LIBRARY

There are 2 private Video Libraries on Youtube. One is recent talks that have been delivered by Zoom by David Priddy. The other is some of the historic videos taken by Richard Cannon. The earliest is 2003. There is also a video of the 40th RKP lecture given by Ralph Hooper to the RAeS Weybridge Branch on 11 November 1992.

The links to the videos are only available to Hawker Association Members; they have been given them.

RALPH SPENSER HOOPER OBE, FREng, DCAe, CEng, MSc, FRAeS, MIMechE - 30 January 1926 to 12 December 2022

Ralph was a tall, quietly well spoken man with a sharp intellect, a dry sense of humour and a prodigious memory. He was supreme at thinking logically through problems and concisely explaining his arguments and conclusions. After all, designing an aircraft is essentially solving a series of problems leading to the configuration that will best satisfy the requirements of the 'customer'. He used to work by putting his thoughts down on whatever piece of scrap paper was to hand with only his last thoughts being typed up, if at all. Fortunately for us Ralph was a great keeper of documents of all types from his handwritten thoughts to final reports and drawings. When he retired he took this collection home and gave it to the Brooklands

Museum where it is housed in the Technical Archive. The full story of the design and development of the Ralph's finest creation, the jet V/STOL Hawker P.1127 and its Kestrel and Harrier developments, is preserved.

Ralph was born in Essex on 30 January 1926 and spent his early years there before his family moved to Hull in 1933 when he was seven. His elder sister, Sheila, was to become a renowned botanist at Kew. He attended Hymers College where he became interested in model aeroplanes and used his pocket money to buy balsa wood to create his own. During the war he was evacuated to Pocklington and then became an engineering apprentice at the Blackburn aircraft company at Brough in January 1942. He gained a Diploma in Aeronautics from University College Hull before joining the new College of Aeronautics at Cranfield in 1946 to study aircraft design under ex-Hawker project engineer Robert Lickley. While there he took up gliding, which became a life-long interest, and went solo on their Tiger Moth in 4 hrs 20 mins. He graduated with a Diploma of the College of Aeronautics in Aircraft Design in 1948 and joined Hawker Aircraft Ltd at Kingston upon Thames, starting in the Experimental Drawing Office as a designer-draughtsman. A man of simple tastes, Ralph bought 1 Field View Cottages close to the Richmond Road factory and lived there all his life. He worked on the structural design of the Hawker Hunter fighter and its supersonic successor, the P.1083, until 1952 when he transferred to the Project Office. It was here that the preliminary design of future aircraft was carried out and was therefore the key to successor failure for the Company.

In June 1957 Ralph began the work which led to the pioneering vertical and short take-off and landing (V/STOL) Hawker P.1127 fighter and was entirely responsible for originating the unique layout and engineering features of this remarkable vectored thrust design powered by the Bristol BE 53 turbofan engine with, initially, twin rotatable nozzles for the fan air. He worked closely with its designer, Bristol Engine's project engineer, Gordon Lewis, proposing twin rotatable exhaust nozzles and contra-rotation of the low and high pressure compressor-turbine shafts thus making all the thrust available for vertical take-off and eliminating gyroscopic coupling effects when manoeuvring in the hover. In 1961 Ralph was appointed P.1127 Project Engineer by Sir Sydney Camm, the Chief Engineer and Managing Director of Hawker. In this role he was responsible for technical control of the project and led the initially company-funded design and development effort which resulted in the prototype successfully demonstrating controlled vertical take-off, hovering flight and vertical landing in October 1959. In all, six P.1127s were built and flown, convincingly proving the correctness of Ralph's concept. He frequently visited Dunsfold in his Sunbeam Alpine to observe the V/STOL flight tests and to talk to the test pilots and flight test engineers.

From the P.1127, Ralph, as Chief Designer (Projects) from 1963, developed the Hawker Siddeley Kestrel FGAMk1 (Fighter, Ground Attack) V/STOL fighter which equipped an international evaluation squadron made up of pilots, ground crew and admin. personnel from the Royal Air Force, the United States Air Force, Navy and Army, and the Luftwaffe. The Kestrel was the first jet V/STOL aircraft in the world to be certificated for service use. The objective of the Kestrel Evaluation Squadron was to examine the military utility of jet V/STOL and this was convincingly proved during ten months of intensive flying, at RAF West Raynham, in 1965.

In 1961 Ralph had initiated Hawker's work on supersonic V/STOL and his P.1154 project won the NATO international design competition, NBMR 3, against contenders from major manufacturers in the USA and Europe as well as the other UK companies. The competition collapsed but the P.1154 was adopted by the UK Government for the Royal Air Force. However, with the first aircraft well under construction the Wilson administration cancelled Hawker Siddeley's contract, together with TSR.2, for reasons of economy. However, a contract was awarded to develop the Kestrel as a less expensive alternative and Ralph directed this design effort resulting in the famous Harrier which was to serve with the RAF and was to be exported to the USA for the United States Marine Corps. This was a real coup as it was against US national policy to buy major weapon systems from abroad but the Harrier's unique qualities prevailed and the Marines were permitted to procure 110 aircraft. Spain also bought the Harrier for her Navy.

Ralph's design continued to be developed under John Fozard, and the Sea Harrier was a crucial Royal Navy asset in the Falklands campaign. Without the RN Sea Harriers and RAF Harriers the South Atlantic Task Force would have been defenceless against air attack - except for short range ship mounted missiles - and the ground forces would have been without close air support. The Sea Harrier was also exported to India where it was in service until 2020.

In 1968 Ralph was promoted to Executive Director and Chief Engineer and as such was responsible for the Hawk jet trainer for which Hawker Siddeley received a contract for 176 RAF aircraft. Through Ralph's foresight, the Hawk, famous as the Red Arrows' mount, was designed from the outset to be capable of development for military roles. It was a major export success with over 1000 sales to 20 countries, so far. Amongst these are 221 serving with the US Navy as their principal jet trainer, the T-45 Goshawk. This variant was developed and manufactured in partnership with McDonnell-Douglas (now Boeing) in the USA. The Hawk was also built under licence in India.

On the formation of British Aerospace in 1977 Ralph was appointed Technical Director of the Kingston-Brough Division. At this time an advanced version of his Harrier was the subject of joint development in partnership with McDonnell Douglas. This Harrier II entered service with the RAF, the US Marine Corps, and the Italian and Spanish navies. Production of the 430 aircraft was a joint effort with a 50% work share between the two companies. In search of economies the Cameron government withdrew the Sea Harrier FA2s and the RAF and RN Harrier IIs selling the latter to the US government as a spares source for the USMC who intend to operate their fleet for many more years.

In the late 1970s and early 1980s Ralph led the Company effort in designing ASTOVL (Advanced Short Take-Off and Vertical Landing) aircraft, the definitive project being the P.1216 fighter. With supersonic performance, great agility and advanced systems combined with the ability to operate from very small bases, the type had significant support in the RAF but, regrettably, some would say, British Aerospace concentrated on marketing the Eurofighter which they judged to have a larger

salespotential, so the P.1216 was stillborn.

When British Aerospace was reorganised in 1984 Ralph became Technical Director of the Weybridge Division and he retired in 1985 (he said he resigned as a mark of protest against how the Company was being reorganised and managed and how the Board siphoned off Kingston's Hawk profits to fund the BAe Manchester (Avro) ATP (Advanced Tuboprop) rather than the single seat Hawk. Afterwards he contributed as a consultant to the Joint Strike Fighter ASTOVL project developed in the USA by Lockheed Martin as the F-35, with significant assistance from BAE Systems, the new name for British Aerospace, who posted a large workforce of engineers to run the flight trials of the F-35B as well as experienced test pilots.

1838 examples of Hooper's aircraft have been built to date. Making these aircraft employed thousands of people in Hawker Siddeley and British Aerospace factories, principally at Kingston and Dunsfold, Surrey; Brough, Yorkshire and Hamble, Hampshire. Each aircraft was fitted with engines built by Roll-Royce at Bristol, and with systems, equipment and avionics from suppliers nation-wide - more thousands of people employed. These activities generated huge cash flows which were vitally important to local and national economies. 1279 of Ralph's aircraft were exported and each contract included spare support and modifications for several years, and training for the operators - a massive contribution to the balance of trade and a direct return to the exchequer in the form of a levy on each aircraft. Ralph's aircraft have served in the front line of the RAF for 34 years, with the Royal Navy for 24 years and have trained several generations of Service pilots, starting in 1976 - a major element in the nation's security. Ralph's aircraft have been in the forefront of international collaboration enhancing the Anglo-American special relationship; industrially through joint projects, militarily through service with the US Navy and Marines and socially through the exchange of personnel. Ralph's aircraft have been, and remain, a national asset.

Ralph joined the Royal Aeronautical Society (RAeS) in 1944 and was made a Fellow in 1970. In 1971 he received the Royal Society S. G. Brown Medal for his work on the development of Vertical Take-Off Strike Aircraft, nominated by the IMechE. He was awarded the RAeS Silver Medal for Aeronautics in 1975 and Gold Medal in 1986. In 1983 he shared, with colleague John Fozard, the Royal Society's Mullard Award, for work which significantly advances Britain's international prestige and economic prosperity, and in 1979 was made an Officer of the Order of the British Empire. In 2008 the American Institute of Aeronautics and Astronautics granted Ralph the F.E. Newbold V/STOL Achievement Award.

Ralph was an experienced and accomplished glider pilot and a life member and stalwart supporter of the Lasham Gliding Society where he was part of a syndicate that owned a Slingsby Kite 2 glider from 1951 to 1957 devising performance modifications. In the early 1990s Ralph bought it restoring it as a flying vintage glider. He was a founder member of the Hawker Association serving on the committee from the start. He supported the Brooklands Museum, not least by donating his papers to the Technical Archive. In his younger days he was a keen skier, walker and mountaineer, even climbing high in the Everest massif. He built scores of plastic model aircraft kits which he never painted - he just wanted to study how other designers solved their problems.

Ralph Hooper was highly respected and admired by those who worked with and for him at Hawker Aircraft, Hawker Siddeley Aviation and British Aerospace, particularly at Kingston, Dunsfold, Brough and Hamble, and by Rolls-Royce colleagues at Filton together with many others in the Ministries and armed services at home and abroad as well as suppliers. Those who knew him personally will have fond memories of him as a friend and colleague. If you visit the Vimy hangar at Brooklands you can see a full size photograph of him next to the Harrier that was fastest East-to-West in the Transatlantic Air Race from London to New York. Ralph died in his care home on December 12th, 2022, aged 96. May he rest in peace.

Ralph Hooper CV

1941-46 Engineering Apprenticeship, Blackburn Aircraft Ltd.

1946-48 College of Aeronautics, Cranfield (Founding course).

1948-52 Experimental Drawing Office, Hawker Aircraft Ltd.

1952-57 Project Office, Hawker Aircraft Ltd.

1957-63 P.1127 Project Engineer, Hawker Aircraft Ltd.

1963-68 Assistant Chief Designer, Future Projects, Hawker Siddeley Aviation, Kingston.

1968-77 Executive Director & Chief Engineer, Hawker Siddeley Aviation, Kingston.

1977-84 Divisional Technical Director & Chief Engineer Kingston, Kingston- Brough Division, British Aerospace.

1984-85 Divisional Director & Deputy Technical Director, Weybridge Division, British Aerospace.

1985 Resigned/retired

QATARI EMIRI AIR FORCE HAWKS

No. 11 Squadron (Qatar) is operating at RAF Leeming as a joint RAF-QEAF enterprise training both QEAF and RAF fast jet pilots. Nine Hawk T.2 Mk 167 Hawks have been ordered. They will carry RAF serials starting from ZB131 (QA01) and QEAF national markings. BAE Systems has been awarded an initial six year contract to provide Qualified Flying Instructors and support. The squadron will provide additional flying hours for RAF pilots and see long-term international investment in new infrastructure and training facilities including a Hawk training simulator and the refurbishment of existing facilities.

Qatar has also ordered 20 single seat and 4 two seat Typhoon FGR.4s, initial training for which is performed by joint RAF-QEAF No. 12 Squadron (Qatar) at RAF Coningsby.

UK HAWK SUPPORT CONTRACT

The Ministry of Defence has invested £695 million pounds in an eleven year service support programme for the Royal

Air Force fleet of 28 Hawk T2 aircraft of No.4 Flying Training School at RAF Valley, a key part of the UK Military Flying Training System (UK MFTS), and the Hawk T1s flown by the Red Arrows. The Hawk contract with BAE Systems (BAES) is valued at £590 million. In addition, a £105 million contract for engine support has been placed with Rolls-Royce. The UK MFTS provides the aircraft, synthetics and training devices to train the next generation of front-line aircrew of all three Services. Upon graduation, the pilots will go on to fly F-35B Lightning and Typhoon fighters.

UK F-35B DELIVERIES

As of November 22, the arrival of three F-35Bs brings the UK total delivered to 30. With one aircraft lost in an accident and three test aircraft in the US, there are now 26 of the type in operational service in the UK. Seven more are due in 2023 with all of the 48 first batch due by the end of 2025

JET ART AVIATION

On November 19th 2022 Chris Wilson, co-founder (with his wife Mel) of Jet Art Aviation (JAA) of Selby, Yorkshire, came to Kingston to talk to the Association about his aviation career in the RAF and JAA. JAA restores aircraft to museum standard display condition, and even for ground running and taxiing. An example of JAA's high standards, currently on display at the Brooklands Museum, is transatlantic air race Harrier GR3, XV741.

After an introduction by Colin Wilson (no relation!) Chris started with a video of a recently completed project, Sea Harrier FA2 ZH798, taxiing at Leeds East Airport, formerly RAF Church Fenton, where JAA rents hangar space.

Chris's enthusiasm for aircraft started aged six with a Matchbox Harrier kit and was nurtured by attending air shows with his family. At 13 he joined the Air Training Corps (ATC) where he had his first flight which was in a Grob G109 Vigilant T.1 motor-glider. Awarded a pilot-navigator scholarship he flew Chipmunks at RAF Turnhouse before joining the RAF at 18 and attending the No.1 School of Technical Training, graduating as the top trainee. He and his second place colleague were posted straight to the Red Arrows as airframe mechanics, the first time this had been done.

He took part in the 'Spring Hawk 1998' training posting at RAF Akrotiri in Cyprus. As a flight line mechanic he flew two to three times per week in the back seat of the Hawks covering air tests in Cyprus and back in the UK for 'Winter Servicing 1998'. In 'Spring Hawk 1999', again at Akrotiri, he had a practice display flight with Red 5 taking some excellent photos on a £15 camera from Argos, which he showed. In the 1999 display season, which included an air show at Kristianstad, Sweden, he flew in many positions in the formations in the reserve aircraft and became an observer during air tests noting full flight envelope conditions (his personal maxima were 44,000 ft, + 8 ½ g and - 3 ½ g.) In 1999 the Reds made a six week Far East Tour with all eleven Hawks (9 + 2 spares). The Hawks were very reliable with few snags. The ground crew flew in the team's Hercules between air show stops which included Amman, Jordan, where a bird strike into the engine and undercarriage was survived without damage; Dhahran, Saudi Arabia (BAe funded); Doha, Qatar; Dubai, UAE; India, Delhi, where there was heavy pollution and smog and the ground support equipment was old and in poor condition, and Calcutta where another bird struck a nose cone and repairs were made with Araldite and speed tape; Thailand; Butterworth and Langkawi supporting a BAe sales drive, Malaysia; and finally Cairo, Egypt. In some overseas shows the height and speed limits were less restrictive than in the UK allowing lower and faster displays.

Back in the UK Chris took a fitters course at RAF Cosford and in 2001 was posted to XI Squadron with Tornado F.3s. The amount of maintenance work required compared with the simpler, reliable Hawk was a real "culture shock". There was more overseas work with the Tornados in Saudi Arabia; Fairbanks, Alaska (exercise 'Cope Thunder 2001'); Thumrait, Oman (exercise 'Sair Sareia') supporting 'Operation Enduring Freedom' coalition attacks on the Taliban in Afghanistan. Here Chris had his first contact with Sea Harrier FA2s which came ashore to make space on the carrier for helicopters. In 2002 the Tornados went to Eglin Air Force Base, Florida. All the ground crew of XI Squadron were given flights in the back seat so Chris added the F.3 to his log book.

In 2003 Chris married Mel, a teacher, and left the RAF. They decided to make a living from house renovation and here Chris learned many hard lessons of project management. After completing two houses Chris moved on to bathroom renovation but not liking the often squalid condition of the toilet systems decided a new direction was needed. 'Jet Art' was the outcome where Chris produced aviation themed furniture and decorative conversation pieces made from salvaged aircraft systems, engines and airframe parts which he sold at air shows such as Biggin Hill and Elvington. He even acquired a Lightning F1 (XM155) forward fuselage which he restored and sold.

Chris and Mel had moved to give more room when, in 2007, Chris came across a stripped Sea Harrier for sale which he thought was restorable but he couldn't afford to buy it. Mel to the rescue; she re-mortgaged their house and funded Chris with the resultant 'home improvement loan'. Thus XZ459, a Falklands veteran, found itself in a field near the family house. Having sourced the missing parts and restored and painted the airframe with the help of some ex-RAF friends, XZ459 sold on E-bay in two weeks! Chris paid off the loan and bought more FA2s and restored them too. Sales destinations included Canada, Greece, New Zealand and the UK. Jet Art Aviation also started restoring for display ejection seats and engines.

In 2009 Harrier T.4 XW269, which had been stripped to support the VAAC Harrier at Bedford, was acquired and rebuilt, outside, in the Winter of 2010 with temperatures down to -9 deg C in the snow. E-bay refused to take this aircraft as they considered it to be a "weapons delivery system" in spite of the fact that it was essentially a shell! However, there was a lot of press and TV interest and two days after being featured on BBC Breakfast TV XW269 was sold. It is now in the Caernarvon Air World Museum.

In May 2011 the Wilsons and their business moved to a farm near Selby, Yorkshire giving more space to store more aircraft for restoration including Tornado GR.3 ZA353, a German F-104 (very rotten - corrosion much worse even than older UK built aircraft, a Swift, for instance) sold to Taiwan, nine Jet Provosts, and Tornado F.3 ZE256, sold to the Estonian National Aviation Museum together with a Jaguar and Harrier GR.3 XZ994.

Harrier GR.3 XZ130, held out of doors by 1034 Squadron ATC at Surbiton on the parade ground from 2005 - 2014, was deteriorating and so was to be sold by the MoD. JAA tendered for it successfully. That was the easy part; extracting the GR.3 from its very confined location, more restricted than when it was installed, and loading it on one lorry was very difficult; especially so as it had not been fully de-fuelled - it had a ton of kerosene in its tanks. However by dismantling the airframe in situ and using a lorry with a built-in crane it was successfully transported to Yorkshire with fuselage, wings, fin, tailplane and nose cone securely on the lorry. Here the airframe was reassembled, fuel system leaks fixed, hydraulic and electrical systems restored to life. The engine had been waxoiled so was well preserved and after 15 months work and 25 years after it had last run, the engine started and ran sweetly, the nozzles rotated and the flying controls functioned. As usual with JAA a full and accurate repaint was carried out with the name Larry Ching, a USAF exchange pilot with No.4 Squadron, below the canopy. The aircraft was sold to the USA where a team will complete the restoration, possibly to flight standard. Chris closed his talk with a video of the first taxi test in America.

Frank Rainsborough gave the vote of thanks for this remarkable "aviation adventure" and presented Chris with a framed print of a Sea Harrier FRS.1 signed by Tim Gedge, CO of 100 Sqn, RNAS. Frank also announced that Chris had said he would return to complete the story - another treat in store.

A HAWKER HUNTER FOR KINGSTON

On January 11th our Chairman, Chris Roberts, after an introduction by President Colin Wilson and a period of silence to mark the death of Ralph Hooper, opened our 2023 talks series by describing the Hunter XL623 restoration project to date, the roots of which go back many years.

The idea to have a permanent reminder in Kingston of the important part played by the aircraft industry in the town's history and prosperity was proposed by the Kingston Aviation Heritage Project (KAHP) group (Editor's note: an ex-Hawker people committee set up at the instigation of John Fozard long before this Association was formed). The plan was to erect a large monument with a Hunter model mounted on an upwardly sweeping curved stainless steel plinth by Kingston bridge. This proved to be too expensive so the augmented funds were used by the successor Heritage Trust to build a replica of the Sopwith Tabloid floatplane which won the Schneider Trophy and set the World Speed Record in 1914. A suitable indoors town centre site could not be found so the aircraft was given to the Brooklands Museum where it is exhibited in The Aircraft Factory display.

In 2018 the Woking Council wished to dispose of a two seat Hunter that had stood for twenty years on a pole outside the now closed Planet night club in the town centre. This was XL623, a significant aircraft it being the last two seat Hunter built, flying on January 17th 1959 and serving with the RAF until 1982. The Council offered to give the aircraft to the Brooklands Museum who in turn asked the Hawker Association to assist in its restoration. The Association agreed to manage and fund the task with the Museum providing workshop accommodation and facilities. The Museum did not want to own the Hunter as they already had examples so it was gifted to the HA with the long term aim of putting it on outdoor display in Kingston near the Richmond Road factory thus achieving the original aim of the KAHP.

A Brooklands Museum and Hawker Association team together with a heavy lift company, paid for by the Woking Council, tackled the Hunter removal task. The aircraft could not be removed from its mount on top of the pole so the pole was cut and the aircraft lowered to the ground. Unloaded the mount could be removed and was retained to be rejoined to the pole when needed. The wings were also reluctant to come off but removal was eventually achieved. Now it could be seen that, because the poor quality wooden intake and exhaust blanks had rotted (one had fallen out) a flock of pigeons had occupied the fuselage for some years and their droppings together with rain water had formed a corrosive mixture which had seriously attacked the airframe interior. Some of these birds stayed in their home as the aircraft was taken to Dunsfold on a low loader where the Dunsfold Park management provided free outdoor accommodation.

Close inspection found that little damage had been sustained in mounting the aircraft at Woking, none in the move to Dunsfold but plenty by the pigeons. The Hunter was then broken down into sections for transport to Brooklands in stages for restoration. Special cradles were made to locate the assemblies on a volunteer's trailer for towing. The main task was to rub down the several coats of paint (two RAF schemes - silver and camouflage, and two Planet schemes - multi coloured and silver). This all had to be done by hand, inside and out, because paint stripper would penetrate skin joints and its removal would not be possible spoiling any chance of a satisfactory repaint. Replacement parts for terminally corroded components also had to be made and fitted as had cradles for holding the assemblies being worked on. When the rub down and repairs were complete the assemblies were thoroughly painted with anti-corrosion primer inside and out.

All was going well when Covid struck which had a massive effect on the Museum's finances as well as halting work on the project. The Museum needed to raise money so decided to let the workshop facilities they had promised as their contribution to the restoration task, to the Heritage Skills Academy. This move complicated and slowed the project considerably as all work now had to be done out of doors at Dunsfold. The volunteers had to travel to Dunsfold, providing all their own tools and transport. The team is Dave Collingridge, Paul Rash, Dave Cotton, Andy Green, Ken Clacher, Tim Hall, Ray Hill, Dave Oatey, Thomas Preskett and Chris Hodson. A shelter was erected and a couple of vans are used for storage. The

task now became essentially a fair weather operation with winter work impossible. The volunteers do all this free of charge, the project funds being used for hardware only. Contributions to the fund have kept the project in the black and it is hoped that this will continue to be the case.

To reduce the work required and so regain some lost time a corrosion-free replacement rear and centre fuselages from Hunter TMk8M XL602 were bought at a bargain price. Appropriately, XL602 had been used at Dunsfold fitted with the Sea Harrier nav/attack system and radar to develop and integrate the equipment. The fuselage was stripped out to reduce weight, repainted inside, fitted with riveted-in jet pipe and intake blanks to keep the birds out and with drains to ensure no water accumulated within. The substantial tail ballast was removed and sold, adding to the funds. In the autumn of 2022 the fuselage was completely assembled and ready for painting.

Meanwhile tentative plans have been made with the supportive Kingston Council to site the finished aircraft on the corner of Tudor Drive and Richmond Road, next to the fire station, on its pole pointing toward and over the 'Hawker' factory site. A survey has shown this 'pocket park' site to be feasible as there are no underground services ensuring that there is room for the massive concrete foundation needed to anchor the mounting pole. Kingston University has checked that the stress calculations made for the original Woking installation are valid and correct. Planning permission will soon be applied for followed by fund raising within the Kingston business community for the installation work.

XL623, painted in its original flying training livery - silver overall with RAF roundels and yellow wing and rear fuselage bands - will be a striking sight for anyone entering or leaving Kingston along the busy Richmond Road and is sure to get their attention. Councillor David Cunningham had been the project's Kingston 'champion' but he has retired. Colin Lewington, the Council Estates Surveyor was a guest at this meeting and during question time he said that he would be happy to act as the new conduit between the Hawker Association and the Kingston Council. This statement was welcomed by the Association which augured well for the future. (Editor's note: local councillor Jamal Chohan has been in touch to offer his support). Frank Rainsborough closed the meeting noting that there were 30 members and guests present and, thanks to Dave Priddy, 35 attending by Zoom; an excellent turn-out.

FRANK MURPHY - PART 2

On 28th February Frank's daughter, Angela Bailey, returned to Kingston to give the second part of her talk on Frank's Career. Your Editor was not able to attend (see Editorial) so he referred to the Association Youtube video library. Sadly and unusually the quality of the sound recording was poor and there were some gaps. Also the visual images consisting mainly of pages copied from magazine articles, press cuttings, photographs both professional and family, letters and log book entries and were very detailed in nature and difficult to summarise. Consequently I decided that I would not be able to produce an accurate report doing justice to the amazing content. I recommend that you have a go at interpreting the Youtube record available at <http://easyurl.cc/HAVideoLibrary>.

Frank's flying activities in this period were largely concerned with Tempest, Fury and Sea Fury, Sea Hawk and Hunter production and experimental flight testing, air racing, aircraft deliveries to overseas customers, point-to-point records, air shows and potential customer demonstrations interspersed with a few crashes due to technical failures. One of these was at Ford with a flamed-out engine, undercarriage up and no flaps, touching down at 200 kn followed by 19 bounces during which Frank became unconscious. His Hunter broke up and ran off the runway colliding with some caravans. Frank survived in his detached cockpit. He also took part in the film 'Angels One-five' flying Hurricane PZ865, 'The Last of the Many'.

VISIT TO THE BOSCOMBEDOWN AVIATION COLLECTION

On 23rd September 2022 a large group of HA members drove to Old Sarum to visit the BDAC mainly to see the first Hawk, XX154, which, as we heard at a meeting on April 13th after the AGM, has been bought by Chris Hodson. He had offered to host us and to carry out some demonstrations on this largely functional, but engineless, airframe.

On arrival Chris gave us an introductory briefing then took us into the hangar where he had a hydraulic rig connected to the jacked aircraft. This allowed him to retract the undercarriage and exercise the flying controls and flaps. The aircraft looked pristine in its highly polished (by Chris) gloss black finish with ETPS (Empire Test Pilot's School) livery.

We then all had a good look round the extensive collection of complete aircraft, nose sections with cockpits, scale models galore and a variety of aviation memorabilia. Aside from XX154 the aircraft included a Sea Harrier FA2, a Jaguar GR1, the Avro 707A, the English Electric P1A, a Tornado, a remarkable BE2 reproduction, and Meteor Mk16 and Jindivik target drones. Among the front fuselages was a Supermarine Swift FMk7, a Harrier GR3, a Sea Vixen and an ETPS Hawk.

While we ate our packed lunches Chris showed some now rare 16mm films including two early Hawk publicity films, one with a perfectly articulated narration by our late colleague John Crampton. There were also early Harrier publicity films, a Ski Jump trials report and a comprehensive Red Arrows film. The tireless Chris himself had overhauled and renovated the 'vintage' projector. We then retired to the hangar where a group photograph in front of XX154 was taken by Frank Rainsborough.

After a wet start the weather was now fine for the drive home following this excellent day out, thanks to Chris Hodson.

NOT YOUR USUAL WAY TO LEARN TO FLY

Trevor Davies recounts a unique experience at Dunsfold...

One of my roles while working in the Flight Test department at Dunsfold was that of Flight Test Observer. This

involved both development and production test flying. Sometime after I started flying I was preparing for a flight with test pilot Jim Hawkins. After we had sorted our test schedule for the flight Jim, a Qualified Flying Instructor (QFI), informed me that as I was occupying the back seat of Hawks quite frequently it had been decided that, should the pilot become incapacitated (for instance by a bird-strike), it would be to the advantage of all concerned if I was capable of getting the aircraft back on the ground in one piece. There was no question of a dedicated training programme but opportunity would be taken of any time that presented itself once the purpose of any flights had been achieved; for instance during transit to / from the test area. The training would therefore be rather sporadic. We started with individual skills which would subsequently be combined into the whole sequence.

On the ground this involved taxiing the aircraft. Aircraft are controlled in yaw by using the rudder, this being connected to foot pedals on a rudder bar in the cockpit. By pressing on the appropriate foot pedal the pilot can yaw the aircraft; press the left pedal and the aircraft yaws left, press the right pedal and it yaws right. However, at low speeds the rudder is ineffective so each pedal has a toe operated section which applies the brake on the corresponding main wheel. Unlike a car brake pedal the toe pedals had hardly any travel and required a much harder press. They each acted independently so that you could steer but that meant that balancing them out to slow the aircraft was also the pilot's job.

For my first attempt at taxiing I wasn't given control until we were in the wide expanse of the main runway - which very quickly didn't seem that wide anymore! We progressed along the runway in a series of erratic zig-zags as I strove to keep the jet away from the grass and as near to the centreline of the concrete as I could. These excursions gradually became smoother and more controlled as I got used to the feel of the brakes. Once at the end of the runway the jet needed to be turned through 180 degrees, adding judicious use of the throttle in order to make the tight turn. Once I had the jet lined up pointing (sort of) along the centreline of the runway Jim took back control so that we could get on with the job in hand. Subsequent attempts improved the precision of control until I was taxiing the jet from, and back to, its parking spot on the flight line, managing to keep the wing tips a safe distance from the expensive hardware parked in the adjacent spots.

In the air the first skill to master was getting the jet trimmed in straight and level flight. As the Hawk has hydraulically powered pitch (tailplane) and roll (aileron) controls the pilot does not feel the aerodynamic force on the control surfaces through the stick. Without any 'feel' control of the aircraft would be very difficult. In order to provide an artificial 'feel' a spring system is incorporated which biases the stick to the central position. The spring system provides a force which increases as the stick is deflected away from the central (zero force) position. This enables the pilot to 'feel' the deflection of the stick (and therefore control surface movement) that is being demanded for manoeuvre. Feeling zero force indicates that the stick has been returned to its initial, stable flight, position. The tailplane angle required for stable flight however varies depending upon the speed / height / aircraft configuration combination at the time. The system therefore also incorporates a mechanism by which the zero force point can be adjusted to 'trim' out the force across the range of stable flight conditions. It was therefore necessary for me to get used to keeping the jet in trim as flight conditions changed, practise making it progressively become more intuitive and automatic. Straight and level flight quickly gave way to holding speed in a climb or descent and to more dynamic manoeuvres such as turns, initially level but then also during climbs and descents.

It was not long before I had to start putting some of these skills together and so one day Jim announced "You can do the take-off today", and then proceeded to brief me through all the sequence. Once in the jet with the engine fired up and all the systems checked Jim got taxi clearance from Air Traffic Control and then handed control of the Hawk to me. The taxi out I'd done a few times but once I had the jet lined up pointing down the runway I was entering new territory. With the 'voice up front' talking me through the procedure I checked from left to right across the cockpit that all the systems and settings were as they should be. With take-off clearance obtained, and a reminder to keep my feet on the brakes, I opened the throttle and checked that the engine rpm and turbine gas temperature (TGT) rose normally and that the engine control amplifier (ECA) held them to their limiting values. Then I released the brakes. And we were off accelerating down the runway at a rate that suddenly seemed a lot more rapid than when someone else was in control! First job keep the jet pointing down the runway, initially using the brakes but, as soon as there was enough draught over the rudder for it to be effective (about 40 knots), using that alone. In no time at all (or so it seemed) the speed was approaching 90 knots and it was time to gently move the stick slightly back to raise the nose wheel clear of the ground so that at around 130 knots only a very gentle further pressure was needed for the jet to get airborne.

Once I had established the briefed pitch attitude and a positive climb rate a quick dab on the brakes stopped the wheels rotating so that the undercarriage could then be retracted, along with the flaps, before reaching their limiting speed of 200 knots. By this time the jet was heading upwards quite rapidly so I needed to level off before we blundered into controlled airspace above us, turn slightly right onto a westerly heading for the transit to the test area and allow the airspeed to build to around 350 knots, then throttle back to hold that speed..... Oh yes, and breathe! That first take-off all seemed to come in something of a rush but, after further take-offs, I progressively started to feel that I was gaining control and no longer just desperately trying to keep up with the jet.

So much for getting off the ground; the next, more delicate, challenge was to get the jet back on it. On a suitable flight, following completion of our test schedule and heading back to Dunsfold, I was given control at a safe height to practice decelerating the jet to circuit speed, trimming the jet as the undercarriage and take-off flap were lowered (hardly any change) and then again as full flap was lowered (quite a significant change). I also had to practise the recovery action if I let the landing approach speed get too slow. It was then a question of repeating these when we returned to Dunsfold (but not, intentionally, the 'too slow' bit!), only this time doing so at the appropriate points in the circuit. We entered the downwind leg, parallel to the

main runway, and once the speed was below 200 knots the undercarriage and take-off flap were lowered and the speed allowed to decrease to around 160 knots. Then, with the downwind end of the runway behind the left wingtip, a left turn was commenced during which full flap was lowered, the extra drag starting the descent towards the runway. The aim was to roll out of the turn lined up into wind and pointing along the line of the runway at a speed of 130 knots and adjusting the throttle to give a rate of descent that would see us reach the runway before we contacted the ground. Sounds simple written like that, but felt more like a one-armed paper-hanger job at the time! As we crossed the runway threshold I raised the nose slightly to reduce the rate of descent and bleed off a bit more speed and then pulled the power back a bit to allow the jet to settle onto the runway. Once I felt the bump of the main wheel touching down I lowered the nose wheel onto the runway and started braking. It was just starting to sink in that I'd actually managed to land the jet when I began to get the feeling that all was not quite as it should be – we didn't seem to be slowing down quickly enough. Co-incidentally the 'voice up front' said "It's all right Trevor, we're on the runway, you can close the throttle now"..... B****r!!

More take-offs and landings followed as opportunity allowed, all building towards the original objective of this training, a check of which was not long in coming. Again flying with Jim Hawkins, as we finished that particular test schedule at 2000 feet just off the south coast, Jim announced that he had just gone unconscious and that I would have to get us home. After which he went silent. Not just a landing then, first get back to Dunsfold. As this was an area we commonly used for test flying I was quite familiar with it. Selsey Bill was just north of and behind us, so I headed east along the coast past Bognor Regis to Littlehampton. Having double-checked that it really was Littlehampton I then turned north to cross the South Downs above the 'Arundel Gap'. While keeping a wary eye out for light aircraft from Goodwood I called Dunsfold air traffic to tell them that we were returning to the field and where we were. Then, with Pulborough below us and Cranleigh up ahead, I was able to identify Dunsfold aerodrome. I prepared to join the circuit for landing remembering to tell Dunsfold Tower when we were positioned downwind to land and again when on final approach (and with a gentle reminder from air traffic) to confirm 'three greens' i.e. the undercarriage was down and locked. I managed not to make too much of a meal of the landing and then taxied in and parked the jet on the flight line where, as I shut the engine down, Jim made a miraculous recovery!

Having confirmed that all the training had achieved its objective I continued to be given opportunities to fly the Hawk, as circumstances allowed, to keep the skills I had learned practised and also to expand on them. During the time I spent flying at Dunsfold I got to fly the Hawk through most of its flight envelope: take-offs, landings, stalling, spinning, supersonic dives, aerobatics, formation flying. Apart from achieving the original objective of the training, from a professional perspective the practical insights that I gained from this training were of great benefit to the ground-based elements of my work planning flight tests and analysing the data from them. From a personal perspective it was an incredibly satisfying experience and I will be forever grateful to Jim Hawkins and all the other Dunsfold pilots involved for having had this opportunity.

HAWK SPINNING INCIDENTS

Andy Jones remembers some spinning incidents....

As Hawker Siddeley Kingston was in fierce competition with the Alpha jet, whose proponents were reputedly telling would-be customers that the Hawk programme was in difficulty over spinning, it was decided that it would be a good idea to demonstrate the opposite by spinning the aircraft in full public view at the SBAC show. For the exercise to be visible we needed a smoke pod and a suitable tank was fitted to the centre station. To get in a ten turn spin plus recovery from 10,000 ft the spin needed to be the high rotation rate type, which could be achieved by feeding in full out-spin aileron as the spin developed. The resulting spin could become a bit oscillatory but it worked well enough on the day. I think I only managed it a few times because of the weather at Farnborough that year but the pictures appeared in all the usual aviation magazines and the comments from the French subsided. Not long afterwards I repeated the exercise in a flight from Dunsfold. I can't remember the reason but I do remember the result; the spin abruptly became violently oscillatory and then transmogrified into an inverted spin whereupon the engine surged. It was rather fortunate that it was at a greater height than it would have been at Farnborough. There would not have been enough height to recover; the French would have been over the moon!

BOOK REVIEWS

(Correction - in NL.65 change TAH Issue 44 to Issue 41.) In Issue 42 the Hawk is included in Prof Keith Hayward's article 'Selling to Saddam' (known at Kingston as Project Saad 25), as is the sale of Sopwith Babies to the Chilean navy. In Issue 43 Keith Hayward tells the story of Teddy Petter's single-seat Gnat light fighter including a very convincing "colourised" photograph of the Midge on the front cover; and Chris Gibson writes about naming the Nimrod MR3, a project of interest to Farnborough (ex Kingston) engineers.

MEMBERSHIP NEWS

The Committee is still working on the definitive list which will be made available to Members. However we record the deaths of Derek Sims and Ralph Hooper and send our condolences to their families and friends.

Please don't forget to pay your subscriptions which are due for 2023/2024. Many subscriptions for earlier years are also overdue. If you have forgotten whether you have paid or not call membership Secretary, Diana Dean, on 01483 810030.