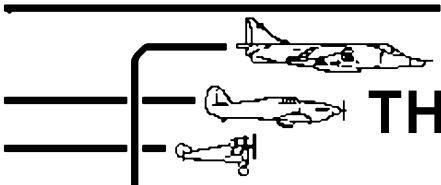

THE HAWKER ASSOCIATION

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EDITORIAL

First, a big thank-you to all of you that have sent in articles. Not all appear in this issue for space reasons but don't worry, they will be in future Newsletters. I'm sure that the articles will bring back memories, so is it too much to hope that some more of you will be inspired to follow suit? You will also find accounts of the well-supported talks, outing and barbecue we have had this Summer; a good indicator that the Hawker Association is still thriving.

Below you will find a report on the presentation of a prestigious and long overdue award to Ralph Hooper. How fortunate we were to have had this outstanding engineer leading us.

You will see in the Programme that on October 15th we have the opportunity to do something really special. Our Chairman and Duncan Simpson have arranged for a group of us to visit the RAF Club at 128 Piccadilly, near Hyde Park Corner, to see the bronze bust of Sir Sydney Camm,modelled by Ambrose, and the information display, all funded by the Association. We will also be given a talk on the history of the Club and have a conducted tour of the beautiful Georgian building which, among other things, houses a huge collec tion of aviation paintings by many distinguished artists. Participation must be limited to about twenty people and the cost will be £20 each including a sandwich lunch. Please contact Barry Pegram on 01306 631125 to book your place. See you in the lobby at 11.30 am.

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PROGRAMME FOR 2008

Wednesday 9th July	"My Life with Hawker Aircraft" - AV-M Alan Merriman
Wednesday 13th August	Social gathering with video.
Wednesday 10th September	Social gathering with video..
Wednesday 8th October	"Airships - The Story of Powered Lighter-than-Air Flight". **Brian Hussey** with Don Williams
Wdnesday 15th October	Visit to the **RAF Club** at 121 Piccadilly with lunch, hosted by Ambrose Barber and Duncan Simpson. Meet at **11.30 am** in the lobby.
Wednesday 12th November	"Restoring and Operating Hawker Biplanes". **Guy Black**
Wednesday 10th December	Christmas Lunch at the Hawker Centre.

PROGRAMME FOR 2009

Wednesday 14th January	Quiz and social
Wednesday 11th February	tba
Wednesday 11th March	"Memories of Folland Aircraft and Hamble". Chris Hodson
Wednesday 8th April	Annual General Meeting and video

Also in 2009 John L Parker will tell us about BAES's heritage plans, Colin Wilson will talk on aviation art and Dick Wise will reminisce about his time in the USA.

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

Brian Hussey is an airship enthusiast and **Guy Black** is the founder of the Historic Aircraft Collection (see NL.16,'Restoring Hawker Biplanes').

The **RAF Club** visit on 15th October is limited to about twenty people and will cost £20 to cover the hire of a room and lunch. Book with Barry Pegram on 01306 631125.

RAF CLUB CAMM MEMORIAL

Members will recall that the Association funded a bronze bust of Sir Sydney and an information panel on his career to complement an existing similar memorial to Reginald Mitchell. The display has now been completed by the purchase of an acrylic painting of a Hurricane Mk II by Robert Calow, Associate of the Guild of Aviation Artists, to hang over the bust to balance a Spitfire print above Mitchell. It is expected that the picture will be in place when the Association visits the RAF Club in October.

SUMMER BARBECUE

Once again an enjoyable time was had by Members who came to the barbecue on 11 June. This time it was indoors - no, not because of the weather but because a commercial for Flora margerine with Gloria Hunniford was being shot outside! Thanks to Ken Batstone and Jan White for arranging the event which included a lively auction with Percy Collino wielding the hammer.

VISIT TO FARNBOROUGH AIRPORT

Les Palmer reports on the Association's 13 May visit to the TAG Airport at Farnborough...

Question: What cost £1 million to purchase and £74 million to fix?

Answer: The TAG airport at Farnborough, Hants!

This was the opening statement made by our tour guide as we commenced our visit. Nine Members came on the visit which had originally been booked by the Handley Page Association who were unable to keep the date. Having a unique relationship with both groups Harry Fraser-Mitchell was able to alert our Secretary of the opportunity and together they plugged the gap.

The TAG engineering group (TAG-Heuer watches etc) is a Swiss based, Saudi owned concern who purchased the redundant MoD site upon closure of the DRA/RAE. They devised a business plan that recognised the need to establish a very special airport in the UK to cater for the increasing numbers of the very rich and famous who do not wish to fly in and out of major public airports. T AG have created a facility which provides the utmost privacy and security for their clients together with an uncluttered environment tha t sees them quickly through procedures and on their way to whatever business or pleasure needs gave rise to the flight. Need a 'limo'at the steps and Customs and Immigration on board? All part of the service!

The hangars have the space for the Boeing business jet as the largest visitor. Full servicing facilities are available and the w hole place is spotless. The terminal, hangars and control tower are all magnificent examples of very modern architecture constructed to portray aerodynamic shapes.

No photography is allowed and no customer names are ever divulged outside the need-to-know groups working at the airport. Some 2,800 yearly movements are licenced at present with twice this number planned. Environmental requirements are a top priority; water treatment plants and an animal sanctuary have been established. The perimeter is grazed by Mongolian horses and cattle who have the best close cropping ability to cope with Hampshire gorse.

The tower, in addition to its everyday function, affords the visitor a most spectacular view of the airfield and its surrounding s which, for our visit, included the early construction work for the Farnborough Air Show. Air traffic control is provided by NATS (National Air Traffic Services) between the hours of 0600 and 2200 daily with the airport open for normal business from 0800 to 1800. During Air Show week the controller staff is augmented by some twenty-two additional NATS personnel to handle the greatly increased number of movements. Normal TAG business is curtailed during demonstration flying.

A prominent landmark seen from the tower is the original HQ of Lord Trenchard, 'father of the RAF', now the home of the Farnborough Air Sciences Trust Museum to which, on completion of our tour, we made our way. Greeted on our arrival by Mr and Mrs Harry Fraser-Mitchell we were ushered into Lord Trenchard's former office to enjoy a splendid buffet very generously provided by Harry and beautifully presented by kind lady volunteers from the Museum.

Afterwards we were given a superb presentation by David Wilson, delivered with the passion of a true aviation enthusiast. The main topic was Samuel F Cody's British Army Aeroplane No.1 which, at Farnborough on 16 October 1908, performed the first officially recognised powered aeroplane flight in Great Britain. Farnborough was the home of the Royal Engineers who had responsibility for balloons, kites and aeroplane development. We were then privileged to be taken to a nearby hangar where a group of Trust members was creating a replica of 'No.1' for display at this year's Farnborough Air Show, together with models of other aircraft of the same period. Countless hours of research and construction have gone into creating the full-scale model. Wood had been sourced in Sweden and the USA. One of our Members observed that the castings being used looked to be of a higher standard than perhaps could have been produced a hundred years ago. "A great observation," stated our guide, but Cody was a friend of fellow American engineer Hiram Maxim of Vickers machine gun fame and it was he who made the castings for 'No.1', hence the high quality achieved. The copy castings for the replica cost £17,000 to have made today.

The Museum contains many very interesting items associated with the work of the former Royal Aircraft Establishment including the fatigue research on the deHavilland Comet. The Museum, which is well worth a visit, is not open every day; for information call 01252 375050. Visits to TAG Airport by recognised groups may be arranged by calling 01252 379000

As a 'thank you' for the visit to the Museum the Association has sent a cheque for £50 to help with the cost of building the 'No.1' replica.

DOCTOR MICHAEL PRYCE- LETTER OF THANKS TO MEMBERS

Mike Pryce would like to thank all those Members who helped him to achieve his D.Phil in Science and Technology Policy at the SPRU (Science and Technical Policy Research Unit), University of Sussex....

Having recently passed my final viva voce exam for my D.Phil, I would like take this opportunity to thank Members of the Hawker Association who kindly provided much help to me in my research. The thesis looked at the different approaches to the design of V/STOL projects undertaken at Kingston and Warton, which was very interesting and opened my eyes to the nature of aircraft design.

Cliff Bore, Chris Hansford, Ralph Hooper, John Strange and Ron Williams all agreed to be interviewed, as well as corresponding with me, all of which provided the basic foundations of my work. In addition John Farley and Tim Gedge were very helpful in providing information about many aspects of Kingston's work.

Barry Pegram and Dick Poole provided insights during a course on V/STOL design they taught at Cranfield University that I attended. Garry Lockley and John Quinn have recently given up their time to talk to me, which has allowed me to begin extending my work beyond the Project Office, and I intend continuing this work, looking at testing and other areas of Kingston's engineering activ ities, now that I am 'free' of the D.Phil.

Chris Farara provided sustained support from the Kingston archive at Brooklands Museum, meeting my requests with constant kindness, as well as reading some of my work and jointly writing a paper on Harrier with me. Without Chris's help my D.Phil would simply not have been possible. His work at Brooklands is very valuable to all historians of technology; the archive is a unique record of the work carried out over many decades that I think is unequalled in terms of its richness of 'day-to-day' detail. It has been Chris's a pproach to preserve seemingly unimportant memos etc and this has proven to be the basis of the archive's value; such memos are gold to those of us trying to understand what really happened, not just what the official reorts and the company PR people said.

One of these documents, written by Ralph Hooper, was the trigger for my D.Phil research. It was very nice to see Ralph receive the Newbold Award (reported elsewhere in this Newsletter) during the recent International Powered Lift Conference dinner at the RAF

Museum. It was clear to me that most of us at the award ceremony would be out of a job if it was not for the work Ralph did in l eading the development team on the Harrier.

I hope that my thesis did justice to the work that all those at Kingston undertook in their attempts over the years to design a Harrier successor. It was very encouraging to be able to present some of the work I did in a talk to the Association some years ago. ('Beyond the Harrier', Newsletter No.12, Spring 2006). I hope to write a book based on the thesis and I am currently extending the work in a project at Manchester University. This involves looking at the Harrier and JSF design teams now in BAE Systems, and it is already clear to me that the spirit of the Kingston design team is still very much alive at Farnborough.

Perhaps I should give the last word to the head of my current project, a former aerodynamicist at Brough, who asked me what my background was. Once I had explained this to him his response was, "Ah, Kingston. They were real engineers!"

HARRIER NEWS

There are eight Harriers on the front line at Kandahar in Afghanistan where they must be kept operational all day, every day. The aircraft are deployed from RAF Cottesmore for six to eight months and after 720 flying hours they are returned to base for maintenance, upgrades and UORs (urgent operational requirements) such as the Sniper pod.

Qinetiq has been awarded a Ministry of Defence contract to oversee and approve upgrades to the Harrier fleet until it goes out of service in 2018. The GR9, serving with the RAF and the RN, will be replaced by the F-35B Lightning II Joint Strike Fighter which is due to enter service in 2012.

HAWK NEWS

In February five Indian Air Force Hawk AJTs took part in the official induction ceremony of the aircraft into the Air Force at Air Force Station Bidar in the southern state of Karnataka. Present were the Indian Minister of Defence Shri A K Anthony, Chief of the Air Staff Air Marshal FH Major and Air Officer Commanding-in-Chief Training Command Air Marshal GS Chaudhry as well as representatives of BAES and Hindustan Aeronautics.

BAES has been awarded support package contracts by the Royal Air Force of Oman worth £4m. Items include spares provision and the procurement of a mission planning system.

In Australia the final software for the Hawk Lead-in-Fighter Radar Simulation System has been accepted after successful squadron trials.

Two of the South African Air Force's 24 Hawk Mk120s have been painted in the colours of the South African flag for use at air shows and demonstrations.

The Red Arrows recently returned from a North American tour. The Hawks were ferried from the UK to Canada while the sixty or so support staff travelled in the team's C-17. The first display was at the Quebec International Air Show where the Red Arrows f lew in friendly competition with the Canadian Snowbirds, the USAF Thunderbirds and the USN Blue Angels teams. Later venues were in Virginia, New York and Rhode Island.

Members will be overjoyed to hear that the RAF is marking the 70th anniversary of the Spitfire's entry into service by painting Hawk XX184 in a 1938 camouflage scheme!

JOINT STRIKE FIGHTER NEWS

It was noted in the last Newsletter that Graham Tomlinson would be making the first flight in the F-35B Lightning II. It happened on 11 June at Lockheed Martin's Fort Worth plant. Afterwards Graham was reported as saying, "That was a really successful first flight. The aircraft flies brilliantly and just about lands itself. It is a charming aircraft - fantastic"

Graham, or GT as he is known, joined the RAF in 1971. His first operational posting was to fly Harrier GRMk3s in RAF Germany. After a fifteen year service career Graham joined BAe as a test pilot eventually becoming Chief Test Pilot at Dunsfold. Graham has been based at Lockheed Martin Fort Worth since 2002 participating in the design and development of the STOVL F-35B including working with the flight simulator. In the BAES newspaper 'Frontline' Graham said, "The Harrier was the first and only successful STOVL fast jet so far, so anything that follows it has the DNA from all those years of flying experience with the RAF and the RN in the UK, with the US Marine Corps and other navies around the world. On the Harrier there are some absolute, inviolable 'golden rules' that have to be follo wed but that kind of constant vigilance is not needed on the F-35B. That's been done deliberately so that the pilot can concentrate on the mission. We have taken full advantage of the latest technology to build a cocoon of safety around the aircraft so that the pilot can't make an idiot of himself, and that is a huge bonus."

The first flight did not involve STOVL and was within a 15,000 ft and 300kn envelope. STOVL will not be explored for about six months. "When we do press the big STOVL button," said Graham, "all the experience we have picked up in the simulator over the last six years will pay dividends." The whole JSF flight test programme for all versions will utilise fourteen development aircraft flying 5,000 hours. BAES is responsible for flight testing the STOVL F-35B, Lockheed Martin the CTOL F-35A and Northrop Grumman the conventional carrier version, the F-35C.

Graham was "also very pleased that the combined international 'Team JSF' has recognised the fact that BAE Systems and its predecessor companies basically brought STOVL to the world. That's why we are sitting at the table right now in 'Team JSF'. I keep thinking, hats off to those long-ago guys (he must mean you, Ralph! - Ed.) at Kingston and Dunsfold who developed Harrier and got it all going in the early 1960s."

FUTURE RN CARRIER NEWS

The BAE Systems and the VT (Vosper Thorneycroft) Group joint venture, BVT, a key part of the Aircraft Carrier Alliance, has been awarded the contract for the Royal Navy's new aircraft carriers, HMS Queen Elizabeth and HMS Prince of Wales, to be the lar gest naval vessels ever built in Britain. On 3 July the Minister for defence equipment and Support, the Rt. Hon. Baroness Taylor, si gned the

contract covering the programme management, shipbuilding, integration and trials of the two carriers, on board HMS Ark Royal in Portsmouth. The Chief Executive of the newly formed BVT is Alan Johnston, formerly Managing Director of Augusta-Westland. It is planned that the F-35B will operate from the new carriers.

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS AWARDS

On July 23, at the end of the International Powered Lift Conference organised by the AIAA and hosted by the Royal Aeronautical Society, a dinner was held in the Milestones of Flight Hall at the RAF Museum, Hendon. Here a number of AIAA presentations were made including the Historic Sites nominations and the FE Newbold award.

Two Historic Sites were honoured: Getafe Airfield in Spain where Cierva made his first autogiro flights and Dunsfold for its role in the development of jet V/STOL aircraft. The Newbold award went to Ralph Hooper.

Chris Roberts gave a speech outlining the history of Dunsfold and Simon Howison spoke about Ralph Hooper's work. The information in these speeches must have done a lot to educate the dinner guests, a large proportion of whom were from the USA. B elow is the abridged text of Simon's speech:-

"At Hawker Aircraft Ltd in 1957 RalphHooper took responsibility for the conceptual design of the Hawker P.1127, which was developed through the Kestrel to the Harrier and Sea Harrier and eventually into the Harrier II. He was entirely responsible for originating the unique layout and engineering features of the vectored thrust design. He set the technical direction of the project and led the design and development effort that culminated in the flying of the prototypes, with successful vertical take-off and landing, hovering and transitions to and from conventional wingborne flight. He then supervised the development of this aircraft into the Kestrel, used by the international evaluation squadron, which led on to the Hawker Siddeley Harrier GR Mk1 that entered service with the RAF in 1969 and was bought by the US Marine Corps as the AV-8A. He was later responsible for the technical direction of the UK side of the US/UK Harrier II programme which established many of the links between the two countries that form the foundation for the STOVL F-35B Lightning II.

The Harrier family, the world's first operational fixed wing jet V/STOL combat aircraft, have been in service for the past thirty-nine years and have proven themselves in numerous military operations including the Falklands, Persian Gulf, Balkans and Afghanistan. The Harrier family therefore represents not just a successful example of technical achievement in V/STOL, but also a potent military capability.

The Harrier family has run to 839 airframes and is in active service with seven air arms in six nations. It has been manufacture d in the UK and USA sustaining many thousands of aerospace jobs in BAE Systems, Boeing, Roll-Royce and numerous other companies around the world and will continue in front line operations, and provide aerospace employment, for many years to come.

The Harrier family is unique in the technical and operational success it has achieved, which eluded numerous other fixed-wing V/STOL concepts. Ralph played a vitally important role in the design, development and production of the Harrier.

The FE Newbold V/STOL Award is presented to recognise outstanding creative contributions to the advancement and realisation of powered lift flight in one or more of the following areas: initiation, definition and/or management of key V/STOL programmes; developing of enabling technologies including critical methodology; programme engineering and design; and/or other relevant rela ted activities or combinations thereof which have advanced the science of powered lift flight.

For the Harrier Ralph did all of these things and more."

Mike Turner, Chief Executive of BAE Systems, was unable to attend the dinner but sent the following message, read out by Simon:-

"Ralph Hooper has made an outstanding contribution to the Company, the country and STOVL worldwide. From the early days of the P.1127, to Kestrel through to the Harrier programme Ralph has led the way. I worked with him at the end of his career at British Aerospace Kingston and it was crystal clear to me from my very first meeting with Ralph that he was an exceptionally talented ma n who was held in the highest esteem by all his peers in the industry. This award is certainly fully deserved, if slightly overdue! I am sorry I cannot be with you to make this award, but my congratulations to you Ralph."

HAWKER'S 'TSR.2' - THE P.1129

Ron Williams tells of his work on this little-known Kingston project...

The mention in the Newsletter of the recent discovery of a P.1129 brochure at the RAF Museum, Hendon, warrants noting a little of the background to events in 1957.

Hawker's private venture, the P.1121 supersonic fighter prototype with a deHavilland Gyron engine, was half built but had aroused no interest and was halted. This Gyron engine was left over from the cancelled Avro large supersonic bomber programme (it used four), which is probably one of the reasons it was offered to us. As usual the Project Office looked for alternatives. Ralph Hooper came up with the P.1127 based on a Bristol Engines vectored thrust proposal. John Fozard drew up the P.1128, a six seat twin Bristol Orpheus engined executive transport based on the wing and tail unit of the Hunter. I took on the P.1129 to meet the OR 339 specification (TSR.2 - Tactical Strike and Reconnaissance). This required a long range, high speed, low level bomber carrying a tactical nuclear weapon , a mission more suited to Tomahawk cruise missiles now.

The P.1129 was an extended wing version of my twin engined P.1125 which used the P.1121's wing and tail unit. Jack Simmonds in the Design Office did the detailed drawings for a submission. The aircraft did not meet all the requirements but was deemed to o ffer better all-round capability should scenarios change, as it did for the Hunter which was designed to an interceptor specification but wa s used for ground attack.

Meanwhile Avro at Manchester, another Hawker Siddeley (HS) company, had their own design looking very much like how the TSR.2 finished up. It was decreed by senior management that two HS companies should not be seen to be competing against eachother so a meeting was set up at Manchester to sort it out. Kingston sent its top team; Sir Sydney Camm and Ron Williams.

We went by train to Wilmslow arriving in the late evening where we were to be met by a car from Avro to take us to a hotel (pub) in Macclesfield. However, we arrived in Wilmslow in thick fog with about five yards visibility, and there was no car. The only t axi had already gone. We waited some time; Sir Sydney was not happy. Eventually the taxi, looking like a pre-war London cab, returned an d after quite a ride we made it to the hotel.

Next day was clear and a car took us to the Avro design offices at Chadderton. Coming from the leafy South I was shocked to see fields of smoking factory chimneys on the way, which obviously caused the fog. The meeting was with the Avro big-wigs. I do not remember their names but Roy Dobson or Roy Chadwick might well have been there. It was agreed to submit only the P.1129. Maybe this was to please Sir Sydney after the car fiasco and not because of the eloquence of my argument. On the way to lunch I overheard the Avro people congratulating Sir Sydney on having such a young, talented team around him (big head!) I probably looked about twenty-five then.

So Kingston submitted but lost to Warton. The P.1127 went ahead ,and as Ralph Hooper is quoted in Roy Braybrook's excellent book 'Harrier and Sea Harrier' (Osprey, 1984), had we won the OR.339 contract the P.1127/Harrier series would not have happened. We would have been left with a void, as was Warton when, as TSR.2, the project was cancelled and the RAF adopted the Navy's HS Buccaneer as an interim solution. However, Warton did go on to make the operationally more flexible Tornado for a similar purpose.

An example of how changing objectives affect the design is when my proposal for a Jet Provost basic trainer replacement (met later by the turboprop Tucano) was turned by Ralph Hooper into a Gnat replacement advanced trainer, the P.1182/Hawk. Thankfully!

PERSONAL REFLECTIONS ON HAWKER THOROUGHBREDS

Introduced by Ambrose Barber, Air Vice Marshal George Black came to Kingston on 14 May with flying reminiscences (he has 9,000 flying hours in 150 types) from his long and distinguished career in the Royal Air Force which he joined in 1950. After flying training in Canada he was posted to No 263 Squadron at RAF Wattisham as a National Service Pilot. On completion of National Service he joined, as was his obligation, the Royal Auxiliary Air Force in 1952 and the following year rejoined the RAF returning to No 263 Sqn. He was seconded to the Fleet Air Arm with NAS 802 then went to the Central Flying School becoming an Advanced Flying Instructor in 1959. In 1961 he was with No 74 Sqn introducing the Lightning into service. Other appointments included CO (Commanding Officer) of No 111 Sqn (Lightnings), Chief Flying Instructor at the Lightning Conversion Unit, CO of No 5 Sqn, Station Commander RAF Wildenrath, Group Captain Operations at HQ 38 Group, Field Force Commander of the RAF Germany Harrier force, Group Captain Operations No 11 (Fighter) Group, Commander Allied Sector One, Brockzetel, Aide de Camp to HM the Queen, Commandant of the Royal Observer Corps and finally Deputy Chief of Operations at HQ Allied Air Force Central Europe from which he retired in 1987 to join Ferranti Defence Systems becoming Director of Military Business Development for GEC-Marconi. He is currently Defence Consultant to Selex Airborne Sensor Systems at Luton.

George's earliest experiences of Hawker aeroplanes were with the Armstrong Siddeley Sapphire powered Hunter Mks 2 and 5. They were, he said, a delight to fly but were plagued by engine vibration and other problems. During intensive flying trials five engine failures were experienced. He personally made a dead engine approach in manual to a successful landing at Woodbridge but not everyone was so lucky. Coincidentally the squadron had the first UK supersonic ejection when a Flt Lt Headley could not pull out from a dive because he had flaps selected.

Whilst on his Fleet Air Arm exchange George flew 800 hrs on Sea Hawks and made 300 deck landings during 15 months at sea. A nice thing about the Navy was that you kept your own aircraft. This was, he said, "The most delightful aeroplane I have ever flown", echoing 'Winkle' Brown's sentiments in his talk to the Association. It was a "pilot's aircraft" in which one felt "at home". George thought the Sea Hawk to be ideal for carrier operations and a big step forward from the Supermarine Attacker. When deck landing it was very steady on the approach at 108-110 kn and using the mirror landing aid usually caught the third wire. As a ground attack fighter the Sea Hawk had excellent handling qualities, from its positive manual elevator and easy powered ailerons, which conferred accurate weapon aiming characteristics. Catapult launches, at 3 longitudinal g giving 150 kn in 150 ft, were made with the hood open in case of ditching. George was on HMS Albion during the Suez war flying 25 sorties in 5 days attacking Egyptian Air Force targets. Some Sea Hawks were lost due to debris ingestion during low level attacks with two 500 lb bombs and the four 20 mm cannon. Night attacks were made by following Glow Worm rocket flares fired from Venoms or Avengers.

His Sea Hawk never let him down although he did bend someone else's aircraft when the nose leg failed to lower and he scraped the nose on the runway. Whilst operating from a carrier in the English Channel his tail hook failed to extend and when he made it to RNAS Ford his engine stopped on the runway, totally out of fuel. Aircraft were often launched in sea conditions so rough that when the bow was down heavy spray swept along the deck. The launch officer would try to time the catapult so that the bow was up on departure but ship motion is not accurately predictable - they can dwell bow down - and George did on occasion experience close-up views of the waves. There were very few problems with the "very well designed" Sea Hawk but, of course, like all aircraft, more thrust was desirable.

When he was Chief Flying Instructor at RAF Coltishall one of the 'perks' was being permitted to fly the Battle of Britain Flight (not yet Memorial) aircraft which consisted of Hurricane LF363 and two Spitfires. The Hurricane, said George, was very simple to operate. These aircraft were loaned to the film company making "The Battle of Britain" and were returned in a rather sad state in spite of the fact that they should have been repainted in their original schemes. However, the film company did give the Flight a Mk II Spitfire at the end of filming. While George was at Coltishall the Lancaster was added to the Flight and he flew in the first Hurricane + Spitfire + Lancaster formation.

Turning to the Harrier he opened by stating that it was a "World-beating concept". It served with the RAF as part of NATO, facing the Warsaw Pact forces in the East, during the Cold War, the aircraft at RAF Wittering covering NATO's flanks, those with RAF Germany dedicated to field operations, initially from RAF Wildenrath. However, from Wildenrath it was 150 miles to the forward bases so the support logistics problem was exacerbated. A forward deployment involved 400 vehicles, 4,000 people and ten train loads of weapons. Consequently the Harriers were moved to RAF Guttersloh where the distance was now only five miles; a very considerable improvement. Here, George was the Field Force Commander with at any one time six sites, each with six Harriers, ready to move every 24 hours to new sites. The weather could be very wet reducing the fields to mud. The STO/VL mode of operation was from 200 m aluminium planking strips and a Royal Engineers' MEXE mat. Concealment by camouflage was vital; the strips were painted green and hides in woodland were employed, effectiveness being checked by recce. aircraft. An early problem was unsatisfactory tow vehicles. With an aircraft stuck in the mud a local farmer was persuaded to bring his Mercedes Unimog along to help; it proved to be ideal so eight were ordered for the Harrier force. In the event of war the peacetime practice sites would not be used; other sites were reconnoitred for this purpose.

George praised the Harrier's war load and wide array of weapons, but the cockpit was not up to the standard of the rest of the aircraft, and poor-weather flying was difficult; it was "not easy in IMC". Little use was made of the FE541 inertial nav/attack system when operating in the field because there was no time to get a full alignment and because it was not always tolerant of the low altit ude highly manoeuvring flight patterns employed. The Wittering aircraft flying greater distances at higher altitudes made more use of it. The FE541 was, it must be remembered, a pioneering analogue system full of little gears and shafts. With its built-in F-95 camera the Harr ier was an excellent ground attack and reconnaissance aircraft. Very high sortie rates were achievable; for example, 400 sorties in one day from 36 aircraft with 30 minute turn-rounds (refuel and rearm).

Aircraft difficulties included bird strikes down those huge intakes, leading to compressor stalls and the loss of aircraft. An e arly operational difficulty had been communications with the Army field HQ but this potential Achilles heel was solved by moving Army liaison personnel into the sites. In peacetime the RAF was prohibited from using 'war stock' weapons so the Harriers flew with a nd fired the reusable Matra 155 68 mm rocket pod and not the definitive Matra 116. However, the Field Force Commander insisted that 'war stock' M116s be tried. It was found that the weapons could not be mounted on the Harrier because one bolt was too short; lesson learned.

George finished with the story of the Harrier UAV (unmanned aerial vehicle, in today's parlance.) Following an engine surge and failure to relight the pilot ejected at 15,000 ft whereupon the engine restarted by itself causing the Harrier to fly on for 25 minutes getting ever closer to the East German border. Unsuccessful attempts were made to shoot it down but fortunately it crashed in friendly t erritory.

After this very well illustrated talk George answered many questions from the floor, the answers to some of which have been included above. The vote of thanks was given by Ralph Hooper.

MY LIFE WITH HAWKER AIRCRAFT

Air Vice-Marshal Alan Merriman came to Kingston on July 9 to tell the Association how 'Hawker' aircraft contributed to his flying career. Ambrose Barber introduced the speaker saying that in 1951 he graduated from Cranwell and then amongst other things flew Hunters with 263 Squadron, was a student at the ETPS (Empire Test Pilots School), flew with 'A' Squadron at the A&AEE (Aircraft & Armament Experimental Establishment),Boscombe Down and with the CFE (Central Fighter Establishment), was the CO of 'A' Squadron, Station Commander of RAF Wittering, CO of the ETPS, Commandant of the A&AEE and Deputy Head of Defence Sales!

The Hunter prototype, WB188, flew, said Alan, just a few days before he graduated from Cranwell in July 1951. After four years of his flying Meteors the Hunter was about to enter service. It had had its problems: buffet and rudder vibration at high Mach n umbers, heavy ailerons and elevator, the latter also being ineffective at high Mach numbers, the flaps were ineffective as air brakes (t heir intended secondary function), pitch-up using manoeuvre flap, and engine surge when manoeuvring, throttle slamming and gun firing.

In early 1955 Alan joined 263 Squadron at Wattisham as they received their first R-R Avon powered Hunter Mk 1 deliveries. Soon came the Armstrong Siddeley Sapphire powered Mk 2. This engine had a better surge margin than the Avon but there were still gun firing surge problems. The Sapphire was not a reliable engine and Alan had to make two forced landings: when the engine would only run at idle and when all the accessories failed. A colleague, Hughie Edwards, achieved notoriety as a result of his Sapphire disintegrating at 12,000 ft during a full throttle climb. He ejected after a manual hood jettison near Stowmarket and after a calm parachute descent managed to avoid a steam train and some 33 kilovolt cables only to crash through the roof of a house nearly into the bedroom of a sleeping 65 year old lady. Intent on rescue, a local raised an unsafe looking ladder to the eaves of the house but the Fire Brigade arrived allowing Hughie to descend without any more heroics. This event hit the headlines in a French magazine: "Outrage - the Nightmare was True!"

Among the types Alan flew at the ETPS was the Sea Hawk. In his three or four flights he found it quite similar to the Hunter but with a very high rate of roll; so fast in fact, that after three rolls it was necessary to ease off the aileron.

At the A&AEE Alan took part in Hunter gun firing trials, the solution to the engine surge problem being "fuel dipping" where the engine fuel supply was automatically reduced as the pilot pressed the firing button. Tests looked at the reaction of the engine at various firing conditions, for gun gas leaks, and at the integrity of the airframe during intensive gun firing. The latter involved firi ng 20,000 rounds from one aircraft at maximum speed, some 600kn, into Lyme Bay Range, only about twenty miles from Boscombe. Four to six sorties were being flown each day and there was some rivalry as to who could get out and back in the shortest time; fifteen minutes from whee ls rolling to touchdown being normal. However, one pilot managed thirteen minutes - but cartridges cases were picked up in Lyme Regis!

The Folland Gnat Fighter had been rejected by the RAF but adopted by the Indian Air Force who requested an A&AEE 'clearance'. The basic idea of a simple, small, fighter was brilliant, said Alan. For example, all three undercarriage doors were used as air brakes and the inboard ailerons also functioned as flaps. However, extension of the undercarriage or flaps gave a strong nose-do wn pitch so full up elevator had to be held on selection. On take-off when retracting the undercarriage the opposite occurred; a strong nose-up pitch. Air Commodore Clouston, the Commandant at the time, was caught out and took off into a spectacular vertical climb. Alan deemed the Gnat Fighter the worst he had ever flown. However, in the later Gnat Trainer, problems were solved.

The A&AEE were also asked to give a deliberate spinning clearance to the RAF's new advanced trainer, the Hunter TMk7. At Boscombe some five hundred spins were made from 40,000 ft. It was found that the aircraft would not recover with out-spin aileron applied; stick central or in-spin aileron was essential. Work was also done on the cockpit layout, the blind flying panel being moved from the centre to the left, the student's station making it similar to the Hunter F Mks. Alan carried out a night lighting assessment flying from Dunsfold. He took off in twilight but by the time he had to land it was dark so he asked Air Traffic Control to switch on the runway ligh ts. The reply was that they had six 'goose-necks' (a kind of crude paraffin lamp) so where did he want them?

Hot weather trials in the two seater at Bahrain involved low level runs at max. continuous thrust, cold soaks at 40,000 ft and -70 degrees centigrade and supersonic dives whose sonic booms caused a visiting Bill Bedford to complain - house had been targeted.

The FGAMk9 Hunter had all the excrescences: gun gas deflectors, 'Sabrinas' to collect the ammo links, chutes for dumping the shell cases etc but the performance was still good. The FRMk10 had nose cameras and was to replace the Swift FRMk5, in RAF Germany, which had very nice aileron controls. The Hunter had more sensitive ailerons and it was thought that this might give problems of camera steadiness. Consequently a gear change mechanism was introduced but in service the original high gear was used habitually.

On his second tour with the A&AEE Alan flew Harriers including a Preview on XV276at Dunsfold and CA Release trials on XV277at Boscombe Down. Other test pilots were Hugh Rigg, Graham Williams and TomLecky-Thomson. Trials included weapon carriage and release, SNEBrocket firing intervalometer tests and engine relighting at up to 40,000 ft at stalling incidence.

The Hawk came Alan's way when he was the A&AEE Commandant. It flew well and reliably although there was a problem at high altitude. The CFS syllabus required demonstrations of stalling and recovery at 40,000 ft! At this altitude with flaps down at the stall the tailplane was ineffective and the aircraft dived until the flaps were retracted. The cause was found to be strong downwash from the flaps and Kingston's cure was to cut away the outboard section of the slotted flap vane.

When it came time to retire Alan chose a Hunter TMk7 for his last flight, a fine tribute to 'Hawkers'. Of his career Alan said that he had "enjoyed every minute of it."

After a lively questions and answers session the vote of thanks was given by Duncan Simpson.

TWO GOOD YEARS AT KINGSTON

Michael Finlay writes about his varied career in the aircraft industry...

Although I worked at Hawker Siddeley Aviation Kingston for just a short period of time I will always treasure memories of my experiences at the company back in those days of my youth.

I left school in 1960 and was employed first by Phillips Electrical in London as a trainee lighting design engineer and later fo r a brief period by a consulting engineers firm working on electrical distribution systems for private and commercial buildings. All well and good, if you like that sort of thing, but I quickly found out that I didn't! I knew that I needed to make a change.

I had always been a bit of an aircraft enthusiast as a boy and spent a lot of my free time building 'Keil Kraft' flying model kits. A particular favourite of mine was the Hawker Hunter powered by a 'Jetex' motor. So, one day when I felt I could not take the boredom of architects' blueprints any longer, I decided to approach Hawker Siddeley at Kingston to see if I could persuade them to hire me. I had, by then, completed my National Certificate in electrical engineering which added a little ammunition to my cause. In due course I w as called for an interview and a week or so later received a letter offering me a job in the engineering design department. I accepted wit hout a second thought; at last I could see a light at the end of the tunnel.

I will never forget the first day when I was escorted up to the second floor and into, what seemed to me at the time, a huge and intimidating engineering design office. In order to familiarise me with the way things were done and with the subtleties of airc raft design I was assigned to the Drawing Change Notice (DCN) group under George Moss. George had been chief draftsman at Blackburn Aircraft until the plant closed and had then taken a job at Kingston to complete his days leading up to retirement. He turned out to be a first class mentor and taught me everything he could during the six months I worked in his group. We became quite close and I still have the slide rule (no electronic calculators in those days) that he gave me as encouragement for my efforts. I knew I had found my niche with aircraft engineering and my enthusiasm knew no bounds. I was so happy to be working in a field that really interested me.

After six months I was chomping at the bit to move ahead in design and George helped me approach Harry Bucket, head of the electrical group. Shortly I was transferred and there I stayed for the rest of my time at Kingston. Those were exciting days, sl ipping down to the Harrier fuselage assembly line, sitting in the cockpit with mock-ups of instrument panels trying to find easy ways to rou te cables in and out and around numerous obstructions. Then it was back upstairs to the drawing board to modify general assembly drawings and to complete the wiring diagrams from which cable assemblies could be built. Those were perhaps the most satisfying and exciting day s of my working life. I was young and enthusiastic, and felt that my efforts were very much appreciated. Harry was a great boss and his 'sidekick' Leo Simpson was also fun to work with.

Stan Whale was chief draftsman at the time and was well respected by everyone. Stan's office was at the back of the drawing office and he kept a pretty good eye on what was going on. Any persistent signs of slacking off and he made a strategic walk pas t the offender's area. We all learned to keep our heads down. This was even more true when a visit from Sir Sydney Camm was scheduled.

I well remember the day that the P.1154 was cancelled. This was to have been a larger, supersonic, development of the Harrier bu t the government of the day made it clear that they were intent on closing the programme down. This was a particular disappointmen t for me as I had already been told that I would be assigned to the project. A protest was organised in London and we were given the day off to march with appropriate banners. Alas, it made no difference and the P.1154 was cancelled.

Other names I remember are Jack Cole, Ted Cronk, Maurice Hillier, Sandie Nesbitt, Alan Jones and John Smith. There are many others I can visualise but whose names escape me having reached an age where my memory is not quite what it used to be.

Oh yes, not to be forgotten, the Friday lunches at the neighbouring Sports and Social Club backing onto the Thames; nothing quite like a beer and a meat pie at the end of a working week!

In 1966 I made the decision to emigrate. This was a time when a lot of younger people were dissatisfied with their long term prospects in the UK and had made up their minds to explore other avenues. Australia seemed to be the answer for me until a contr act company made an offer of definite employment in Canada. I therefore changed my plans and left for Canada in August after a pub s end-off by my friends at Hawkers.

So started a new life for me. After working for six months at the Steel Company of Canada (STELCO) in Hamilton, Ontario, I managed to land a job at deHavilland aircraft in Downsview, a suburb of Toronto. At that time deHavilland was owned by Hawker Siddeley, so having obtained a decent reference from Harry Bucket I was taken on without too much fuss. I started in the instrument group working on the DHC6 Twin Otter flight panels and early autopilot installation. During my thirty years at the company I made slow but steady progress, moving on to the Dash8 series in all its variations after Twin Otter production terminated. By this time the company was owned by Boeing but after a few years Bombardier took over and put a lot of money into revitalising the place.

Eventually I moved out of design into the programs office and finished my days as production manager of the electrical shop. Finally I retired in 1998 but afterwards did a little contract work including a further year in the deHavilland methods group. I am now fully retired.

I can only say, "Where did all the years go?" I think in all honesty my time at Kingston, brief though it was, stands out more t han any other period if my life. Hawkers was unique; and so were the characters that I met there!

MEMBERSHIP NEWS

Congratulations to Mike Pryce on receiving his D.Phil in Science & Technology Policy; see his letter of thanks earlier.

We welcome new Members Richard Cripps (USA), Steve Franklin and Arthur Balchin.

Sadly we record the deaths Mike Stroud, that stalwart of the Marketing Department and aviation enthusiast extraordinary, and David Cooper of Production Development. Technical Representative Bill Hitchcock, has also died. Condolences to all their families and friends.

JOSEPH WHITE

The Editor received the following e-mail from Ray White...

I came across your website whilst searching for information and photos of the Hawker Aircraft factory at Canbury Park Road. I am doing some family research and my late father worked for Hawkers before and after the second world war. As a boy he lived in Teddington and started at Hawkers as a 'shop boy' in 1932 at the age of 15 at Canbury Park Road. He became a skilled fitter/airframe assembler. He left to join the army in 1943 as a despatch rider in the Royal Corps of Signals. He was discharged in December 194 6 and worked elsewhere for a while before returning to Hawkers in September 1947. At this time he was living in Tolworth. He remained with Hawkers until August 1957 when our family emigrated to Australia. I remember my father saying he worked on the Hawker Hind, Hurricane, Sea Fury, Seahawk, Hunter and on the prototype P.1127. On your site I was reading the 'memoirs' of Doug Halloway and he mentioned an Eric Brooks. I remember my father talking about working with an Eric and I wonder if it was the same man.

Ray asks if anyone remembers his father, Joseph White, and has any photographs of the Canbury Park Road factory and its workers. If you can help in any way please e-mail him at rpwe@ozemail.com.au, copy to the Editor, or, if you don't have e-mail, contact the Editor who will e-mail any information you may have.

MEMBERSHIP LIST AUGUST 2008

A: Mike Adams (a), Ken Alexander, Peter Alexander, John Allen, Martin Alton, Terry Ansty, Alma Apted (H), Steve Apted, John Arthur, Alan Auld, Bryan Austin, Mike Azzopardi. **B:** Brenda Bainbridge, Arthur Balchin, Colin Balchin, Ambrose Barber, Paul Barber, Ray Barber, Derek Barden, Peter Barker, Geoff Barratt, Graham Bass, Ken Batstone, Dennis Baxter, Colin Bedford, Anne Beer, Guy Black (A), John Blackmore, Keith Bollands, Paul Boon, Betty Bore (H), Pat Bott, Steve Bott, Bob Bounden, Mike Bowery, Alan Boyd, Pat Boyden, Phil Boyden, Roy Braybrook, Clive Brewer, Laurie Bridges, Doug Britton, Arthur Brocklehurst (a), Capt. Eric Brown (H), Peter Brown, Ron Bryan, Christopher Budgen, Maurice Budgen, Roy Budgen, Reg Burrell, Robin Burton. **C:** Richard Cannon, Maurice Carlile, Chris Carter, Bob Catterson, Ken Causer, Jeremy Cawthorne, John Chacksfield, Colin Chandler, Keith Chapman, Keith Chard, Gerry Clapp, JF Clarke, John Cockerill, Hank Cole (a), Bob Coles, Percy Collino, Brian Coombes, Paul Cope, Patricia Cosgrove, Ron Cosgrove, George Cotterell, Nick Cox, Shirley Craig (H), John Crampton, Richard Cripps, Tony Cripps (a), Russ Culley, Richard Curtis. **D:** Roger Dabbs, Clive Dalley, Andy Dalton, John Danse, Afandi Darlington, John Davie, Jo Davies, Ken Davies, Trevor Davies, Charles Davis (a), Diana Dean, Ralph Denning (A), Norman Deviell, Mike Diprose, Richard Dobbs, Mike Dodd, Colin Dodds, Lambert Dopping-Heppenstal, Jack Dowson, Brian Drew, Peter Drye, Dick Duffell, Jean Duffell, Gwen Duke (H), Chris Dunhill, Mike Dyke. **E:** John Eacott, John Eckstein, Andy Edwards, Dave Edwards, Barry Elliot, Tony Elliott, Eric Ellis (H), Celia Evans, Norman Evans, Roy Evans. **F:** Russ Fairchild, Paul Fairweather, Ian Falconer, Mike Fantham, Chris Farara, John Farley, John Farrow, Max Fendt, Stan Field (a), Geoff Fieldus, Mike Finlay, Wilf Firth, Anne Fletcher, Richard Fletcher, Colin Flint, Dave Fowler, Mike Frain, Steve Franklin, Harry Fraser-Mitchell, Geoff French, Mike French, Heinz Frick. **G:** Roy Gaff, Mike Gane, John Gardner, Patricia Gardonio, Peter Gates, Sandie Gear (H), Tim Gedge (A), Mark Gerrard, Tony Gibbs, John Gilbert, John Glasscock, Pat Goodheart (H), Eric Goose, John Gough, Andy Green, Barry Grimsey. **H:** Douglas Halloway, Liz Hargreaves, Simon Hargreaves, Bryan Harman, Dawn Harris, Guy Harris, Thelma Harris, Brian Harvie, David Hassard (A), David Hastie, Norman Hayler, Eric Hayward, Bob Head, Sheila Hemsley (H), Jock Heron (A), Keith Hertzenberg (a), Frederick Hewitt, Merlin Hibbs, Richard Hickey, Peter Hickman, Vince Higbee (a), Reg Hippolite, Keith Hobbs, Chris Hodson, Gordon Hodson, Derek Holden, Doc Holliday, Richard Hooke, Ralph Hooper, Linda Hopkins, Paul Hopkins, Mike Hoskins, Gerry Howard, Dawn Howes, Terry Howes, Simon Howison, Gordon Hudson, Gavin Hukin. **I:** Pete I'Anson, Len Illston, Maive Impey, David Ince (A), Brian Indge. **J:** Keith Jackman, John Janes, Gordon Jefferson, Harry Johnson, John Johnson, Brian Jones, Ian Jordan, Trevor Jordan, Robin Jowit, Alf Justin. **K:** Brian Kent, Dennis Ketcher, Bill King, Dave King, Charles Kirk. **L:** Barry Laight, Mike Laker, Charles Lamb, Richard Lane, George Latham, Paul Latham, Pam Lawrence, Andrew Lawson, Stanley Lawson, Geoff Lee, Gordon Lewis (A), Mark Lewis, Vernon Lidstone, Gary Lillistone, Andrew Lloyd, Gary Lockley, David Lockspeiser, Norman Long, Gordon Lorrimer, David Lovell, Lynda Lucas. **M:** Albert Magee, Al Mahoon, Mick Mansell, John Marsh, Bill Marshall, Ann Martin/Disspain/Turk, Dennis Mason, Brian Maton, Don McGovern (a), June McKeon, Ronald Mears, Mike Mendoza, Jim Middleton, Buffy Milford (H), Robert Millar, Jack Mills, Brian Monk, Pat Moon (H), Leslie Moore, Pauline Moore, Nicholas Morland, Pete Munday, Carole Murphy, Gloria Murphy (H), Martin Murray. **N:** Anthea Newman, Jennifer Nicholas. **O:** Roger O'Brien-Hill, John O'Sullivan, Robin Owen. **P:** Les Palmer, Glynne Parker, John I Parker, John L Parker, John Partridge, Bernard Patrick, John Pearce, Barry Pegram, Martin Pennell, Bill Phillips, Ted Pincombe, Dick Poole, Don Pratt, Dave Priddy, Mike Pryce (A). **Q:** John Quinn. **R:** Clive Radley, Raharto (a), Frank Rainsborough, Colin Raisey, Paul Rash, Diane Raymond, Vanessa Rayner (H), Douglas Reallf, David Rees, Peggy Remmington, Francis Rhodes, Geoff Richards, Bill Richardson, Chris Roberts, Graham Roe (a), Elizabeth Ruscoe-Pond (H), Chris Russell, Peter Ryans. **S:** Ian Sandell, Bernie Scott, Alex Seaman, Ray Searle, Maurice Shakespeare (a), Mike Sharland, Arthur Sharpe, Bill Sherwood, Douglas Shorey, Peter Sibbald, Jack Simmonds, Sadie Simmonds, Duncan Simpson, Derek Sims, Gerry Sims, Charles Smith, Don Smith, George Smith, Harold Smith, John Smith, Karl Smith, Pete Smith, Selwyn Smith, Roy Sparrow, Peter Spragg, Vivian Stanbury (H), June Stephens (H), John Strange, Carroll Stroud (H), Christine Strudwick, Tony Strudwick, Douglas Stubbs, Bill Swinchatt. **T:** David Taylor, Stuart Taylor, Brian Tei, Reginald Thompson, Geoff Tomlinson, Graham Tomlinson, Rod Tribick, Peter Trow, Ron Trowell, Bert Turner, Michael Turvey. **U:** John Underhill. **V:** Herbert Valk. **W:** Terry Walker, David Ward, Harry Webb, Patrick Webb, Graham Weller, Rob Welsh, AP West, Bryan West, Judith Westrop, Jenny Wheatley, Phil Wheatley, Jan White, Mick White, Roy Whitehead, Peter Whitney, Annette Williams, Don Williams, John S Williams, Ron Williams, Sally Williams (H), Colin Wilson, George Wilson, Paul Wilson, Dick Wise, Helen Woan, George Woods, Len Woodward, Alan Woolley.

(Note: A = Associate Member, a = Associate, H = Honorary Member)