JABBERWOCK 114

The Magazine of the Society of Friends of the Fleet Air Arm Museum

February 2024

SOCIETY OF FRIENDS
FLEET AIR ARM MUSEUM

IN THIS ISSUE

THE NATIONAL MUSEUM ROYAL NAVY

The Society of Friends of the Fleet Air Arm Museum

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We are extremely grateful to all those who contribute articles and material to the magazine, even though it is not always possible to use every item!

ADMISSION
Members of SoFFAAM are admitted to the Museum free of charge, just advise you are a SoFFAAM member to the reception staff. Members can bring up to four guests (one guest only for junior members) on any one visit, each at a reduced entrance fee, currently 30% off the standard price. Members are also allowed a 20% discount on goods purchased from the shop and cafe.
Note: These concessions are provided at the discretion of the General Manager of the Museum and could be removed at any time.

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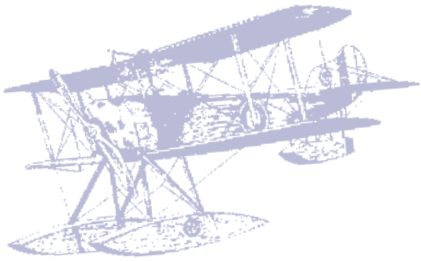

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COVER ILLUSTRATION
An iconic photo of an 809 Naval Air Squadron Buccaneer S2B overflying HMS *Ark Royal* (RO9). A very fitting tribute to this Squadron as they have just stood up at RAF Marham with the F35B Lighting II. See the short photo report on this edition's back cover.

Editorial

2024 is well under way, but we are glad to wish all our readers a happy and peaceful New Year. We look forward to a stimulating programme of varied talks and visits.

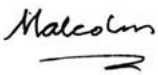
At the recent AGM, the Society's Council welcomed two new members and focused on a re-allocation of responsibilities, with new faces in the Treasurer and Secretary roles. Graham Mottram stood down as Chairman after steering our Society through some difficult times, for which we owe him our sincere thanks. Membership numbers, which have been slowly declining for several years, now seem to have stabilised, partly due to energetic recruiting by Council members at various aviation events.

In this issue, we carry the second part of coverage of India's aircraft carriers, which describes their new and completely indigenous aircraft carrier as it joins the expanding Indian Navy. Elsewhere in the news, readers may have seen details of a massive new Chinese aircraft carrier, showing that naval aviation is an expanding military influence in the Indo-Pacific region.

Closer to home, under a deliberately misleading title, Graham provides a little-known story concerning the brother of murder victim David Blakely and his wartime exploits as a Swordfish pilot in the Fleet Air Arm. We also carry a detailed description of the continuing capability improvement to the Merlin and Wildcat aircraft of the FAA's front line.

In "Snippets from Council Meetings" we provide brief details of an innovative way in which the Museum has requested funding. This is for a travel bursary, to assist the attendance of school children in visits to the Museum. Although we have not provided funding in this way before, it is entirely in accordance with the Society's objective, which is "The education of the public by support and … assistance to the Museum." As attendance by schools has fallen off in recent years because of the cost of travel, we hope that this initiative will go some way towards improving matters.

Also at the recent Council meeting, we regretfully decided to discontinue the occasional talks on Saturday mornings for lack of sufficient volunteers to organise and conduct such talks. The evening talks, however, continue to attract sizeable audiences.



Malcolm

Council snippets

From the December Council Meeting

The General Manager commented that FAAM's general performance has continued to be very positive, we have had a very good and consistent year so far.

We have appointed Ameresco UK to partner with the Museum in the improvements to Cobham Hall. The project will include provision of a new roof coating, new rainwater management system, Installation of Photovoltaic (PV) Solar Panels and installation of energy-efficient light-fittings throughout. The Museum is proud to have re-launched "the Barracuda Live: The Big Rebuild", in late September and formally open the Arthur Kimberley Viewing Gallery.

The Museum had made an appeal for funding, as follows: The number of schools visiting the museum now, compared with pre-Covid, is down approximately 50%. We know that for many schools, the cost of transport (and asking parents to pay) is a problem. If the Society could fund a travel bursary, for which schools could apply for help with transport costs, this would enable more children to visit. An example for us to start with might be offering up to £450 per month (totalling around £5000 across the year). The Chairman regarded this proposal as fitting precisely within SOFFAAM's Objective and the Council agreed to make available a single payment of £5,000 for FAAM to spend in line with its proposal for the year ahead.

Since the onset of the Covid pandemic the AGM has been conducted via Zoom only and AGM attendance numbers have increased as a result. The General Manager asked if this format will be continued, because he has received outside requests to hire the room. Council agreed that due to its success, the Zoom only AGM should continue.

Richard Macauley reported that the external events to date were proving their worth and attracting younger members. 21 new members have been recruited at recent events. It was agreed that quotes should be obtained to buy a more robust gazebo for use at these events.

Saturday Talks have been postponed pending finding someone who is prepared to take responsibility for organising them and assembling a suitable team to assist them on the day.

Letters to the editor

Dear Malcolm

Some of the aircraft enthusiasts on the SoFFAAM Council were commenting on the transfer of ex-navy Sea Kings to Ukraine. This is part of the UK MoD assistance in supplying aviation assets to assist their on-going fight against the illegal invasion of Ukraine by Russia.

While attending the Yeovil Model Show last September, I spied a model of a Sea King in Ukrainian markings and this triggered the following. Chris Penney went and photographed the model and posted same on the SoFFAAM Facebook page which solicited this response from Steve George: In 1982, I was serving with 820 Naval Air Squadron, embarked in HMS *Invincible*, as the Deputy Air Engineering Officer.

Early in June of that year, I was part of a detachment of two Sea King Mk 5s, sent inshore to provide support to the units advancing on Port Stanley.

On a particularly awful night (gales, snow, etc) we were tasked at short notice to provide an aircraft to get Major General Jeremy Moore into Port Stanley

A model of an ex RN Sea King painted in Ukrainian colours as supplied to them by the MoD. © Chris Penney

Sea King XZ920 operating in the Falklands in 1982. © Steve George

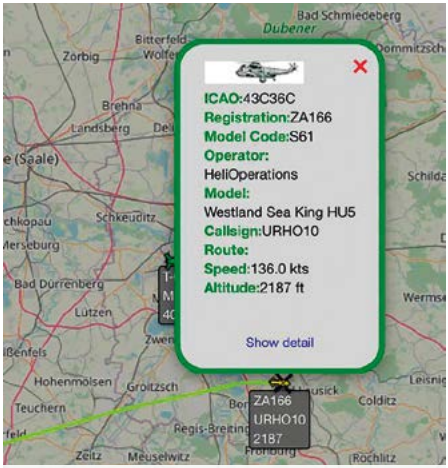
to agree and accept the Argentinian surrender. Our two aircraft, equipped with radar and also highly skilled crews, were the only ones able to carry out this task. This aircraft, XZ920 '010', flown by our senior pilot Lt Cdr Keith Dudley, was the aircraft that did the job.

Now here's the thing. XZ920 is one of the three Sea Kings that the UK has supplied to Ukraine as utility aircraft. It's amazing and comforting to think that XZ920 along with ZA134 another Falklands veteran and 820 NAS machine (013) are still serving and helping Ukraine.

...and there's more, in an update to my recent post about the Ukrainian helicopters. It now appears that the third Sea King delivered to Ukraine, is ANOTHER ex 820 Squadron aircraft, ZA166 - which joined 820 in September 1982 on our return. Some odds, eh?

Thanks to Steve for supplying the photo of XZ920. For those of you who remember my piece about following aircraft on radar tracking websites from Jabberwock 108, below is a screen shot of ZA166 heading across Europe to Ukraine on 21/12/2022

Regards,
Richard Macauley



Screenshot supplied by Roger Wilcox

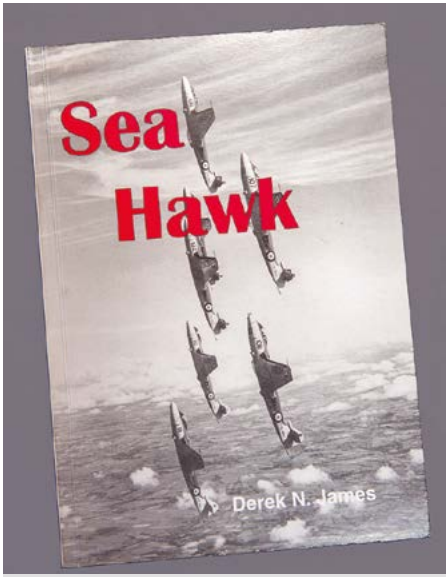
Dear Editor

Some members may be unaware that the society used to produce a booklet series on naval aviation types.

No.7 was on the Sea Hawk and due reference is given to the publication for background information on India's development of a naval air arm, details of which can be found in the article on Indian Navy aircraft carriers in this Jabberwock.

The Sea Hawk was rejected by the RAF, but saw service with the Royal Navy in 13 frontline squadrons and eight 700-series squadrons: 806 Squadron being the last user upon disbandment at Brawdy in 1960.

Regards,
Chris Penney.



Cover of the Sea Hawk edition.
© Richard Macauley

Sea Harrier FRS2 in the Carrier exhibit hall.
© Laurence Whitlock

SoFFAAM's new Treasurer Laurence Whitlock supplied the picture above. He said he found himself with a few hours to spare, so where better to spend them but in FAAM.

If anyone finds themselves in the same position and wants to send us their photos of FAAM subjects, we will be happy to consider them for future Jabberwocks.

Dear Editor

This photograph was taken from the car park in about 1990 at the Trengilly Wartha Inn, Constantine, Cornwall.

We had just dug a large pond with an island and some bright spark thought it would be a good idea for the "victim" of a 'dining out' to be lowered onto the island from where they would have to swim/wade across to get to the pub for a beer and lunch.

I am hoping that the Jabberwock readers may be able to recall this particular event, perhaps someone was there and can remember this happening and would like to comment? Needless to say I very much doubt it would be allowed today!

Best wishes
Nigel Logan

Dear Malcolm

My good friend Den Wood has died at the grand age of 99, at a care home in Burnham-on-Sea. You may recall he was a founder member of SoFFAAM and grew up around Yeovil and Yeovilton.

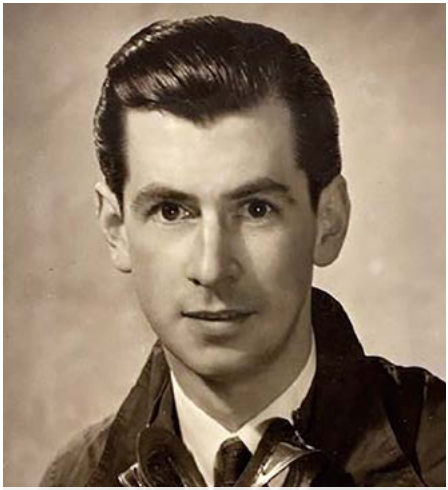
Here is a photo of him at Biggin Hill Heritage Centre five years ago when he flew in a two seat Spitfire.

Best wishes,
Jeff Turner

Ruth Ellis and me

By Graham Mottram

Ruth Ellis



David Blakely

For those who do not recall Ruth Ellis, her fate can be briefly explained. On 10 April 1955 sports car racing driver David Blakely was shot to death by his mistress Ruth Ellis outside the Magdala public house in Hampstead.

Tried at the Old Bailey in June 1955, she was convicted of murder and was hanged at Holloway Prison on 13 July. There were calls for a reprieve, but the authorities probably felt that a working-class girl should be punished for the murder of a so-called gentleman. David Blakely had a limited claim to being regarded as a gentleman, based on his wealthy stepfather and education at public school, but he was a hard drinking womanizer, who enjoyed carousing in London nightclubs. Ruth Ellis was not his only girlfriend, and he was physically abusive to most of them. His father was a Scottish doctor who practised as a GP in Sheffield for most of his life. His mother was Irish, named Annie Moffett, and there were four Blakely siblings in all. David Moffett Drummond Blakely was the youngest and possibly the one most spoiled by his mother. His two brothers both saw active service in the Second World War and his sister, Maureen, was a Bletchley Park Wren.

His parents' marriage broke up in

1934, when Dr John Blakely was accused of procuring an abortion for his waitress girlfriend, Phyllis Staton, who later died. That is where I claim my link to the story because the unfortunate lady lived in a part of Sheffield called Darnall, which I used to frequent as a little boy. My father worked at a factory on Cresswell Road, near where Dr Blakleys girlfriend lived. Dr Blakely would often have passed the front of the factory when visiting her. Mrs Blakely left him and found a wealthy replacement, one Humphrey Wyndham Cook (ex-Royal Flying Corps) whom she married in 1941. If David had not been interested in motor racing before then, he certainly would be now, his stepfather having raced on and off since 1914, and put the huge sum of £75,000 into the ERA company. Although David Blakely did his National Service as a subaltern in the Highland Light Infantry, it was the other two Blakely boys who really did their bit for King and Country.

His oldest brother Derek Andrew Gustav Blakely joined the RAF soon after the outbreak of war and qualified as a pilot. He was shot down in Hudson AM658 in December 1942, and later went on to win a DFC. He stayed in the RAF until about 1960 and then became an airline pilot. He died in Australia in 1998,

The middle brother, John Brien Blakely, joined the Fleet Air Arm. His commission as a Sub Lt RNVR dates

David Blakely shows his MG TC to older brother Brien.

The graves of David and Brien Blakely, near that of their mother and stepfather.
Photo attribution: www.pennchurch.uk

from July 1941, after he gained his wings. He was appointed to join 828 Squadron as a Swordfish pilot. The squadron had been decimated in a raid on Kirkenes in July 1941 and its CO, David Langmore, was rebuilding his squadron with young men straight out of training, who joined the Squadron at Crail late in September 1941. A few days later, this inexperienced group embarked in HMS *Argus* for advanced training during a transit to Gibraltar. They transferred to *Ark Royal* on 16 October and set out for Malta. Two days out of Gibraltar, *Ark Royal* launched 11 Albacores and two Swordfish, heading for RAF Hal Far at Malta, 450 miles away, to relieve the pressure on 830 Squadron, the sole FAA strike unit on the island. 830 had been formed in July 1940 at Hal Far, equipped with Swordfish, and had been attacking German convoys. The pressures of these operations and attacks on Sicilian and Libyan land targets in support of the desert campaign, meant that by the spring of 1942 the two squadrons were combined under the title of the Naval Air Squadron Malta. There were probably many more aircrew than aircraft and a few lucky men were permitted leave in Gibraltar. On 5 April 1942 the destroyer HMS *Havock* sailed for Gibraltar to be repaired following damage incurred in the Battle of Sirte. In addition to its own crew, it carried passengers including the past captain and engineer officer of the destroyer *Legion*, three airmen officers, Brien Blakely, T G Davidson and D J Bunyan; and more survivors from other damaged ships.

The airmen anticipated a break from operational flying after six months of hardship and danger on Malta. However, a navigational error led to *Havock* ploughing into a sandbank off the Tunisian coast and the ship was quickly assessed a total loss. All on board survived but were rounded up by the Vichy French authorities and sent to Campe Des Internees Britanniques at Laghouat. Vichy France was neutral, so these men were technically internees, not Prisoners of War, but this made little difference. Men were shot trying to escape, and some spent weeks in solitary confinement. Lt Charles Lamb RN, who had been captured after landing his Swordfish on a salt lake, had become an unofficial adjutant of the Commonwealth internees, possibly because he was a navy boxing champion and, as one malcontent was warned "likely to knock your bleeding head off".

The arrival of *Havock's* crew and their passengers aggravated the congested accommodation in Laghouat. *Havock's* young CO was advised by Charles Lamb that camp rules needed to be different from shore base rules if the internees and their captors were to get along. Brien Blakely's colleague Davidson wrote to his parents in Newcastle as follows:

"...We are right on the edge of the Sahara here ...there is a shortage of water, food and everything else... all our money was taken from us and our clothes except one suit. ...[there is] barbed wire three rows thick and about 8 feet high. ...We have about 200 yards to walk about inside and are allowed out for two hours twice a week to exercise.... we are allowed a third of a loaf and half a bottle of wine a day as well.... I never feel satisfied but it is enough to keep us going... We share rooms in pairs - Brien Blakely is my partner..."

The camp was liberated by American troops in November 1942. The men from *Havock* had "only" endured six months in captivity, but they were relieved to board a troopship for home. Most had suffered significant effects on their health. Brien Blakely was appointed to 774, an Armament Training Squadron at St Merryn, HMS *Vulture*, before going, seemingly as a test pilot, to the Aircraft Yard at Coimbatore in India.

During Blakely's next few years, he may have left the navy and then returned; he was a Lieutenant RN with seniority of March 1949 and in 1953 was on exchange with the Royal Canadian Navy at Shearwater. His health might have been permanently impaired by his imprisonment, but he regained his flying category. However, he died tragically young in 1963 from encephalitis, at the age of 43, and is buried alongside his much more infamous brother in Holy Trinity Church, Penn, Buckinghamshire. In the same graveyard are the remains of the children's author Alison Uttley, and the Cambridge spy, Donald Maclean.

Thanks to: www.pennchurch.uk

See also: https://www.youtube.com/watch?app=desktop&v=ydJ1ivifiRU

War in a Stringbag, Charles Lamb, Cassell & Company 1977. A Destroyer at War, Goodey & Osborne, Frontline Books 2017.

A photo review of HMS *Falcon*, Hal Far, Malta.

By Richard Macauley

In the last edition of Jabberwock we carried the sad news of SoFFAAM member Jack Colebeck's passing as reported by his son Roger.

However, Roger kindly supplied a series of photographs of Lt Cdr Jack Colebecks time at Hal Far, Malta which Roger was keen to share, as given the rich history of HMS *Falcon* as a Fleet Air Arm airfield, this may provoke some memories, fond or otherwise amongst our readership.

Hal Far airfield, was possibly one of the most popular FAA and RN foreign postings throughout the decades. It was the first permanent airfield constructed on Malta, its location on the Island gave it a position of great strategic importance in the Mediterranean, providing a base for all units disembarked from carriers on the important route to the rest of the Empire. Because of more favourable winds over the sea than Malta's other airfields, Hal Far became the preferred diversionary airfield.

Excellent range facilities nearby made it the ideal location from where intensive armament training could be undertaken by squadrons on their arrival. At times, especially in the late 1920s to mid-1930s, and again in the 1950s, Hal Far was one of the busiest airfields in the entire Fleet Air Arm; indeed, for a time between 1958 and 1962 Hal Far was of particular importance to the FAA as its only remaining overseas land station after the closure of Sembawang in Singapore.

728 Sqn at Hal Far dispersal, 1966, TT20 Target Towing Meteors. © Roger Colebeck

728 Fleet Requirements Unit aircraft in formation off Hal Far, Malta. A DH Sea Heron C Mk20 communications aircraft, flanked by Meteor TT20s and Meteor Mk7 at the rear. © A Wreford

Lt Cdr Lofty Wreford and CPO Donaldson by a DH Sea Heron C Mk20. © A Wreford

Lt Cdr J Colebeck saluting the last White Ensign to fly at Hal Far, 31 May 1967. © A Wreford

**728 Fleet Requirement Unit disbandment party, possibly at Ronnie's bar?
Far left, Lt Cdr Jack Colebeck AEO, second from right, Lt Cdr Peter "Lofty" Wreford CO 728. Back row in whites is Lt Brian Friend. © Image courtesy of a 728 Sqn member**

Genesis of Lynx Wildcat

By Malcolm Reid

The ultimate dynamics systems demonstrator for Lynx Wildcat, G-LYNX.

The Lynx Wildcat initial specification was derived between AgustaWestland and the MoD's Lynx Integrated Project Team (IPT) during the late 1990s. This was 23 years after Lynx volume production commenced in 1976.

The aerodynamics and dynamics of rotor and transmission systems in the Basic Air Vehicle of Lynx Wildcat were, mostly performance-enhancing features in G-LYNX, holder of the outright helicopter world speed record in 1986 – which still stands today! However, the airframe high speed optimising modifications of G-LYNX were not retained in the new Lynx Wildcat airframe. The speed record was achieved three months after the Westland Board made the decision to extensively modify a Mk 1 Army Lynx and make the record attempt. This was made possible within limited budget and timescales by adopting performance upgrades from the Westland 30 civil helicopter. This had a larger, heavier cabin to accommodate 17 passengers in airliner-style seats. These upgrades were i) transmission power/torque uprating, ii) higher tail rotor thrust, iii) full-width tailplane with two fins, iv) higher power Rolls Royce Gem 60 engines. The progression of Lynx performance upgrades is tabulated as follows.

Type & Mk	Service	Initial MAUM (kg)	Target MAUM (kg)	Engines	Max. power (contingency) (SHP)
Lynx AH Mk1	Army	4535	—	Gem 2	900
Lynx HAS Mk2	Royal Navy	4763	—	Gem 2	900
Lynx HAS Mk3	Royal Navy	4876	—	Gem 42-1	1135
Lynx AH Mk7	Army	4876	—	Gem 41-1	1135
Lynx HMA Mk8	Royal Navy	5330	—	Gem 41-200	1135
Lynx AH Mk9	Army	5126	—	Gem 41-1	1135
Lynx AH Mk9a	Army	5126	—	LHTEC CTS800-4N	1361
G-LYNX	N/A	4535	—	Gem 60*	1305
Westland 30 - 100	N/A	5602	—	Gem 41-1	1135
Westland 30 - 100-60	N/A	5806	—	Gem 60-3	1260
Wildcat AH Mk 1	Army	5790	6250	LHTEC CTS800-4N	1361
Wildcat HMA Mk 2	Royal Navy	5790	6250	LHTEC CTS800-4N	1361

* The Gem 60 engines were specially rated and modified with a water methanol injection system.

Essential to attaining the world speed record was the British Experimental Rotor Programme (BERP) rotor blade, a revolutionary design with composite materials manufacture that produced a major performance enhancement.

The final Westland Project Office study of Lynx developments, WG 61, in 1997 was immediately followed by the issue of an Army Air Corps (AAC) requirement for a Lynx replacement and the Lynx Light Utility Helicopter (LLUH). This was followed by Ministry of Defence Operational Requirement SR(A)446, endorsed in 1998 to create a sustainable fleet up to 2018. The proposed approach was to increase the commonality of the Lynx AH.7 and AH.9 fleets with wheeled undercarriage, avionic content, creating a common modification standard and establishing a single maximum flying weight. Rotor and transmission components would be retained for in-service operation making for major cost-savings.

It became clear to both the Lynx IPT and Westland that the proposed modifications would result in a heavily compromised solution, as the airframes would become life expired before their Out of Service Date (OSD). Westland offered a programme that included replacement airframes to overcome this limitation. This was already implemented for several export Navy Lynx customers, with continued use of the high value dynamic components. At this point the concept of Future Lynx was born. LLUH transitioned to the Battlefield Light Utility Helicopter (BLUH) programme which aimed to i)

Lynx Wildcat BERP rotor blade.

Army Lynx Mk 9As. Note the up-turned exhaust pipes © Andy Walker

restore aircraft performance to levels seen on service entry, ii) improve the ability of the AAC to operate Lynx from maritime platforms and iii) introduce a common fleet-wide build standard and allow an OSD well beyond the planned 2018 date.

A formal Westland proposal describing Future Lynx was published early 2001. This was based on the Super Lynx 300 export airframe, equipped with LHTEC CTS800-4N engines, offering a maximum all up mass of 5.79 tonnes (12,765 lbs) at the in-service date with guaranteed growth during its service life. Re-use of most of the dynamic components was key in this proposed approach. RN interest in an enhanced HMA.8 Lynx fleet, or a replacement, was clear at this time. The MoD requested any proposal made should include how common airframe and avionic system could satisfy both needs, but as of early 2001, no formal naval Operational Requirement had been published. To ensure that the in-service growth path was practicable and affordable, considerable effort was applied in defining the impact of an increased all up mass to 6.25 tonnes (13,779 lbs). The proposed airframe and dynamics load paths were all sized or re-confirmed as compatible with this requirement. The baseline airframe would include strengthened primary load paths, a re-designed tail cone to accommodate increased tail rotor thrust, a revised nose accommodating the defined BLUH sensors and the assumed naval role sensors, compatibility with crashworthy wheeled undercarriage and incorporation of modifications identified by in-service repairs applied to the Lynx fleet.

The transmission and rotor systems were reviewed in close detail to establish compliance with contemporary airworthiness codes. No limitations were revealed other than for the tail rotor and main rotor performance at the OSD operating mass. The tail rotor would be replaced immediately, and the main rotor blades were proposed to be exchanged for the

British Experimental Rotor Programme (BERP) IV standard as and when the operating mass rose significantly above the ISD value. No change was proposed to the rotor diameter, nor the number of blades as had been indicated by the WG.61 studies. This was made possible by detailed analysis of performance and reserve strength available in the standard Lynx dynamic components and the predictions of BERP IV performance benefits.

Available gearbox clearance to the extant UK military airworthiness codes would not permit the Future Lynx to satisfy the key hover out of ground effect requirements at the maximum entry into service all up mass. However, previous civil certification of this same transmission standard had demonstrated it had the potential to transmit significantly more power and a military release to the level required for compliance was considered viable following additional testing. Mindful that the outcome of such tests could be an adverse impact to fatigue life and cost of ownership, a modification was proposed to replace the conformal gear sets with involute gears, combined with a simultaneous change to an improved gear steel. These new gears required no other specific modification to the transmission and were able to raise the available power to levels compatible with a mid-life mass growth level.

The BERP IV rotor blade technology would reduce transmission power required at any given mass, such that the proposed change to involute gear forms in combination with the change of rotor blade was compatible with the projected out of service gross mass. The extensive, detailed and comprehensive survey of strength and performance margins from the baseline Lynx design was unavailable to the Project Office when they laid out the configuration

RN Wildcat helicopter test firing its defensive aid suite above HMS *Diamond*. © Lt Cdr Oliver Clark/MoD

of WG.61. Additionally, programme cost constraints featured large in the Company proposal for Future Lynx which dictated that modified design features could only be proposed if justified in close detail.

The Future Lynx programme evolved to cover both BLUH and its sister aircraft, the Surface Combatant Maritime Rotorcraft (SCMR). Commonality between the two aircraft would be such that a reconfiguration of sensors would be largely all that separated them. The undercarriage is common to both types, having a selectable application of the oleo gag which assures a constant ride height when the aircraft is secured on deck. A harpoon to secure the helicopter to a deck grid is a role fit and has utility only when operating from a small ship. It is unlikely that the Army version would be deployed in this scenario, but the aircraft can be fitted if so needed.

The airframe, initially based on a strengthened Super Lynx 300, would further evolve to include re-shaping of the nose and tail boom together with the use of modern monolithic structural components which dramatically reduced the parts count.

In support of Operation Herrick, the AH.9 Lynx were re-engined with 1361 shp CTS800-4N engines brought forward in the Future Lynx programme. Camp Bastion, in Afghanistan has an elevation of 3000ft with a maximum air temperature above 30°C from April to October, i.e., ISA + 21°C or greater for seven months of the year, Hot and High by any definition! This extreme environment demanded higher engine power and for desert conditions, an engine intake sand filtration system to prevent serious erosion damage. In this engine it is integral, thus incurring minimal power loss. Upturned engine exhaust pipes were installed as protection against heat-seeking missiles.

The rising costs of the increasingly complex avionic systems with 'glass' cockpit displays and weapons systems for both versions had to be constrained within the prescribed budget. Therefore, Army and RN fleet sizes had to be restricted accordingly and proposed items in the Future Lynx 2001 definition of digital Automatic Flight Control System (AFCS) and Active Control of Structural Response (ACSR) vibration reduction were not included. Furthermore, for operational and logistics cost management, another part of the IPT's remit was to explain the decision to base the whole fleet at RNAS Yeovilton.

In December 2005, the MoD awarded AgustaWestland a contract for 62 Future Lynx helicopters. This was to provide the Army with 34 aircraft and Royal Navy with 28. At the same time, Future Lynx was re-named Lynx Wildcat. The export version of the Future Lynx, known as the AW159, is in service in South Korea and the Philippines. They incorporate the new digital AFCS, which may yet find its way into the UK fleet.

The compiler of this article was a member of the AgustaWestland Future Lynx team working with the MoD's Lynx Integrated Project Team. He acknowledges and thanks a former AgustaWestland Project Engineer and three former MoD personnel for their insight and content.

Yeovilton Wildcat & Merlin updates

With acknowledgements to MoD Navy and the Commando Helicopter Force. By Chris Penney.

847 Naval Air Squadron Wildcat gave a role demo to the Dutch public at Den Helder Navy Days. © RN

Two 847 Squadron Wildcat AH1s joined NATO's annual Baltic exercise in June/ July 2023 as part of the RN's Littoral Response Group (North) deployment.

During the multi-national naval and air exercise they operated with amphibious forces landing on the Polish coast. The squadron is one arm of Yeovilton's Commando Helicopter Force (CHF) supporting Royal Marines along with the Merlins of 845 and 846 squadrons. Unusually the Wildcat pair embarked in Royal Fleet Auxiliary (RFA) *Mounts Bay*, a *Bay*-class Landing Ship Dock (LSD). They used the vessel's aft flight deck, which is only large enough for a single helicopter to operate. *Bay*-class LSDs are central to the Royal Navy's new Littoral Response Group (LRG) strategy, as are the LPD (Landing Platform Dock) assault landing ships HMS *Albion* and *Bulwark*; one of which is rotated through maintenance. However, neither ship class features a permanent helicopter hangar.

847 Wildcat roles include ferrying Royal Marines and their equipment, calling in and laser designating precision munition air strikes, naval gunfire coordination, escorting landing craft ashore, inserting commando raiding teams and reconnaissance for troops

moving inland. The Baltic assignment enabled the aircraft's wider battlefield integration with assets of regional allies including Sweden. They returned via the Netherlands, attending the Koninklijke Marine's navy day celebrations at their main port of Den Helder to mark 50 years of Anglo-Dutch amphibious training. Both countries are to evaluate procuring new Multi-Role Support Ships to replace HMS *Albion* and *Bulwark* and their Dutch equivalents.

To enhance the UK military presence in the Indo-Pacific Littoral, LRG (South) has been established at Duqm, Oman. The RN-led group will patrol the western Indian Ocean and exercise with the region's largest blue water navy, that of India. The group will include RFA *Argus*, currently designated as a casualty receiving ship, which has been nominated as the interim Littoral Strike Ship. *Argus* started life as the container ship MV *Container Bezant* and taken up from trade in 1982 during the Falklands War. The 28,000 tonnes RFA vessel has a spacious hangar, providing full technical support to helicopters. In preparation for the move east. *Argus* performed USAF Special Forces Osprey compatibility trials off Portland and carried out embarked training for the AH-64 Apache attack helicopters of 656 Squadron, Army Air Corps (AAC). 656 Squadron is dedicated to work alongside Royal Marines and 847 Squadron's Wildcats. The Indian Ocean LRG's air component is anticipated to include 656 Squadron's newly delivered AH-64E. JHC (Joint Helicopter Command) tasks 845, 846, 847 squadrons and AAC helicopters in both the littoral and land domains.

With the Royal Marines' increased operational tempo overseas, the Fleet Air Arm has reassessed the Merlin Mk 4 Ship Helicopter Operating Limits (SHOL). The SHOL trials team included 846 Squadron and Boscombe Down's Rotary Wing Test and Evaluation Squadron. The Mk4's take-off and landing load limits were explored in differing wind speeds, humidity conditions and sea states. Over 350 deck landings were performed aboard *Albion*. These included into wind landings 'heavy' across a range of headings relative to the ship's position and aft facing landings, offering a 360-degree SHOL clearance. A revised Mk4 flight envelope was defined for recovery aboard without undue workload for aircrew. The new clearance means it can lift 12 additional marines or operate for two hours more with extra fuel, allowing deeper ingress of hostile

RFA *Argus* with 845 Squadron Merlins and 847 Squadron Wildcat AH1s embarked. © RN

territory. Additional range is useful for Joint Personnel Recovery combat SAR missions behind enemy lines. The updated take-off and landing clearances apply to all Merlin Mk4 operations, including those dedicated to Littoral Response Group (South) flying in hotter conditions. The revised Mk4 SHOL is being assessed for its applicability to the Merlin Mk2 anti-submarine warfare aircraft based at RNAS Culdrose.

In a first for a naval air squadron, a Wildcat HMA2 from Yeovilton-based 815 Squadron has downed an aerial target using the type's new Martlet missile. Previously, Wildcats have only fired the weapon at surface targets, as detailed in Jabberwock 106. During trials at the Cardigan Bay range, MoD Aberporth, the Martlet missile system neutralised the equivalent of small, fast-moving craft from speed boats to jet skis, as well as airborne threats. The tests were led by the Operational Advantage Centre (Maritime Warfare), the Navy's lead tactical development organisation, supported by Boscombe Down-based 744 Squadron, Yeovilton's own 825 and key industry partners. Improving lethality and operational advantage for front-line squadrons is a core OAC function and this involves testing weapons' optimum performance under different war-fighting conditions including defining maximum range.

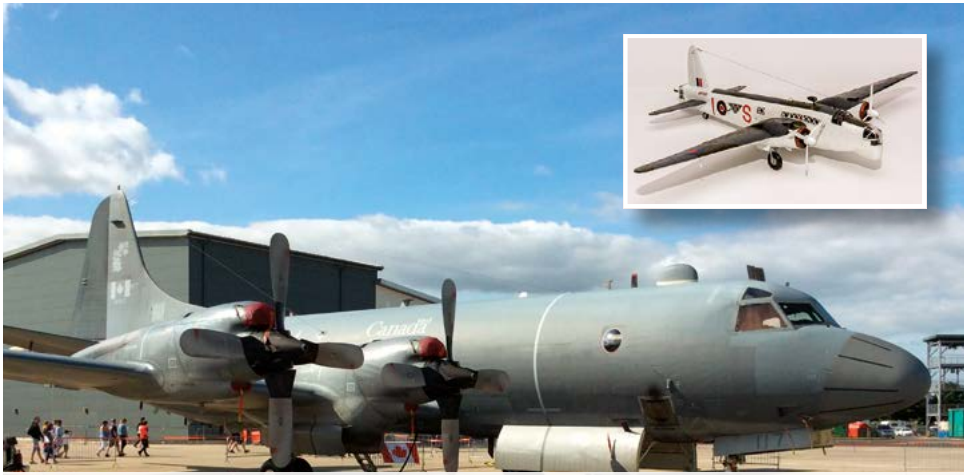
The aerial target used in the trials was a Banshee drone, a modern successor to the RAE Llanbedr's radio-controlled Jindivik. These drones are just 10ft long compared to Jindivik's 26ft and can fly at 400mph with a range of over 60 miles. Banshees were first trialled in 2021 aboard HMS *Prince of Wales* and are operated by RNAS Culdrose's 700X NAS. They can help mimic airborne threats such as the Shahed 136 loitering munition currently being used against Ukraine. The CO of 815 Squadron, Commander Stuart Crombie remarked: "The Martlet firings conducted by an 815 Wildcat... have proven the devastating air-to-air lethality that Wildcat offers. This capability places us in a unique position amongst the UK's – and the world's – military helicopters. Maritime strike – on, under and now above the waves – is at our core, and 815 stands ready to defend our carrier strike groups day and night."

Merlins of 846 Squadron are twinned with Portuguese 751 Squadron, adding to 650 years of treaty ties between UK and Portugal. © RN

700X Naval Air Squadron jet-powered Banshee target drone aboard HMS *Prince of Wales*. © RN

LG Groves Safety Awards Part 2

By Chris Penney



407 Sqn CP-140 Aurora at Yeovilton's 2019 Air Day and model of Wellington MP652/S. © Chris Penney

There were many notable operations during the Second World War where weather forecasting proved influential, including Dynamo's Dunkirk evacuation; Overlord's Normandy landings; Market Garden's airborne assault at Arnhem; and Plan Y's central Burma offensive.

The loss of nine young RAF airmen aboard 517 Meteorological Squadron Halifax METIII RG380/N at Crowcombe on the Quantock Hills, Somerset, on 16 September 1945 spotlights the largely ignored history of aerial meteorology. The aircraft was attempting to land at Westonzoyland, having been diverted from Brawdy after completing a 9.5-hour sortie over the Atlantic. All hands were lost due to multiple shortcomings in air safety, including the assessment that the aircraft had descended below its safety altitude. A memorial to the aircraft's crew was unveiled at the crash site on 6 September 2016 and every five years the Groves family gather at the memorial to remember Louis Grimble Groves RAFVR and his fellow aircrew. The resultant LG Groves Awards have helped ensure a safer operational culture for today's military aircrew.

The UK Meteorological Office was incorporated in 1919. By the 1930s,

a teleprinter distribution network was established to disseminate forecast information to government departments both at home and overseas. At the Admiralty, the need for greater meteorology observation had already been highlighted by aircraft carrier operations after the Great War. Commenting on the period, RAF Meteorological Flight Commanding Officer Jeffrey Quill AFC, later Chief Test Pilot of Vickers Supermarine, remarked: "The RAF in those days was very far from being an all-weather air force" and aeronautical 'met' service provision proved inadequate for the exigencies of war.

From 1937 onwards, RAF meteorology information was provided to Bomber Command and its six Group Headquarters, as well as Fighter and Coastal Command Headquarters. Wartime expansion meant a shortage of experienced military 'met' staff and a Volunteer Reserve meteorological section was formed to help. Given the UK's prevailing westerly winds, RN weather forecasting from warships in mid-Atlantic was essential to plan the RAF's forthcoming bomber campaign over Europe. However, the commencement of hostilities prevented such reporting due to Admiralty-imposed radio silence and Coastal Command had to step in to fill the void. The lack of naval Atlantic weather reports particularly hindered forecasting for Coastal Command, as most of their sorties were flown to the westward. Its requirements were for a 24-hour service combined with a vastly increased reporting frequency for day and eventual night air operations out to 700miles (1126km) in the Atlantic.

Major Dave Hardy RCAF and Rob Peters grandson of Pilot Officer Arthur Peters one of the 407 crew killed in 1943. © Graham Moore

Britain and Germany recognised the importance of gathering weather information during the bitterly fought North Atlantic campaign. After the fall of France, the Luftwaffe began shipping reconnaissance from airfields on the French Atlantic coast. Focke-Wulf 200 Condor maritime bombers had the range to reach Iceland and by 1941 were flying around Eire to land in occupied Norway. Their mission was to locate convoys but also to note weather conditions en route for naval planners. To meet the requirements, the Luftwaffe formed dedicated wettererkundungsstaffeln (weather reconnaissance squadrons). Away from convoy routes to the northeast of Iceland the Kriegsmarine stationed weather trawlers. They received HQ radio messages in the Enigma naval cipher and this allowed Bletchley Park's codebreakers a vital Ultra intelligence breakthrough in May 1941. A daring RN destroyer operation seized the weather ship *München* and with it her Enigma code deciphering settings. Later, in March 1944, U-boat U-653 on weather-reporting duty was located and hunted to destruction by the sloop HMS *Starling* and 2nd Escort Group together with 825 Squadron Swordfish from the escort carrier HMS *Vindex*.

845 Squadron Merlin Mk4 overhead Broomfield Church. © Chris Penney

Coastal Command had faced many shortages at the war's start, including aircraft, crew and appropriate operational bases. The aviation environment of the eastern Atlantic quickly highlighted limitations, such as the lack of types capable of all-weather operations and aircrew inexperience. After the defeat and occupation of France, losses to U-boats rose alarmingly and the Command's stretched resources were additionally needed in the southwest, as well as performing anti-invasion duties in the southeast. Four Fighter Command Bristol Blenheim squadrons had earlier been transferred, but to assist much-needed maritime and photo reconnaissance tasking, Army Co-operation Command provided 53 and 59 Squadrons with Blenheim reconnaissance bombers. Although the 265mph Blenheim Mk IV was designated a tactical aircraft, it had a range of over 1,100 miles and in November 1940 three specialist Meteorological Flights formed on the type. Stationed at St Eval, Cornwall,

Aldergrove in Northern Ireland and East Anglia's Bircham Newton, each 'met' flight performed 'non-operational' navigation sorties with the route preset. This led to navigator work overload and would later see a trained meteorological observer accompany each sortie to make detailed weather observations.

In early 1941 Coastal Command meteorology headquarters at Chatham on the southeast coast, Plymouth in the southwest and Pitreavie Castle, Scotland, became 'met' sections of Liverpool's joint RN/RAF Derby House Headquarters. Coastal Command also assumed control of meteorological units within the RAF's other commands. Reorganised, Coastal's newly designated 19 Group HQ at Plymouth focused solely on 'met' reporting for the southwest approaches and Bay of Biscay: the principal exit routes to the North Atlantic used by Germany's U-boat fleet. 19 Group's 'met' flight at St Eval received the new reconnaissance Lockheed Hudson (a converted US airliner supplied via Canada) in late 1941. Subsequently additional obsolescent Handley Page Hampdens were taken on strength and on 11 August 1943 this Flight became 517 Meteorological Squadron.

Coastal Command began operating the Halifax Mk II, with its greater endurance, by late February 1943; the British heavy bomber's debut being with 58 Squadron at Holmsley South, Hampshire. 517 Squadron at St Eval received Halifax MET Mk Vs during November 1943. After conversion to this type, the squadron moved to Brawdy in Pembrokeshire. But once fitted with additional fuel, the Halifax METV was found to be underpowered and replaced by the more capable MET Mk III during March 1945. In the meteorological Halifax, the 'met' observer sat in a modified glass nose. Weather ops often involved flying into treacherous conditions, with low cloud always being an issue. Sorties could be 10 hours and flown from sea level up to the aircraft's service ceiling. Anti-submarine patrols were also undertaken, with depth charges carried and aircraft wore Coastal's standard overall white 'crow' camouflage. It was a feature of meteorological squadron tasking that weather missions would still be flown when operational sorties by other Coastal squadrons could be cancelled due to unfavourable flying conditions. Finally in 1945 RAF Meteorological Air Observers were awarded mission aircrew single-wing 'M' flying badges – worn on the uniform left chest.

Among the work performed by the meteorological squadrons during the Second World War was that which helped identify the weather window for the launching of D-Day in 1944. Post-war, Australian efforts to recognise the contribution of the senior aviation meteorologist in Ceylon, Wing Commander Arthur Grimes, for ensuring operational safety of Far East 'Double Sunrise' missions detailed in Jabberwock 77 came to nothing. In the UK there is no dedicated memorial to either the photo reconnaissance units or the meteorological squadrons of Coastal Command.

Turkish Delight

By Tim Smith

Turkish F4E taking off for a morning sortie. We were allowed to be immediately on the runway edge on the 'Press Day' for these movements. © Richard Macauley

The Aegean Odyssey described in the previous Jabberwock continues into Operation Anatolian Eagle, an exercise hosted by the Turkish Air Force at 3rd Main Jet Base Command in Konya.

Our flights necessitated a stay over in Istanbul, which was wonderful and another tick off my 'bucket list'. Luckily Richard Macauley had been before, so he acted as tour guide (though thankfully without an umbrella). Following his advice, we visited The Blue Mosque and Hagia Sophia in the evenings after an early meal thus escaping the crowds and we were able to walk straight in. During the day the queues are enormous. We completed our trip with the de rigeur trip on the Bosphorus after visiting the Grand Bazaar. I finished the weekend with a tour of the Topkapi Palace, early arrival is essential to be ahead of the crowds. These wonders were all within easy walking distance of our centrally placed hotel which had a roof top terrace with a marvellous view of The Blue Mosque, only a couple of hundred yards away. Just the place to enjoy a cold beer after

a day's walking.

The flight to Konya by Pegasus Airlines was in the evening. It was an easy drive into town from the airport, surreal to think that we would be back there the next morning to watch the military planes. We were pleased to find our hotel upgraded us to a mini suite (although it seemed to me to be maxi, bigger I suspect than some homes). I was left wondering what the 'proper' suite would be.

We had applied for and were allocated press day passes for this exercise. After having our security passes issued and a welcome by the base commander followed by a group photograph (it seems the military worldwide love a group photograph; it brought back memories of courses I had attended) then we were off in the buses to start the day. During the days on base, we were moved around to avoid having to photograph into the sun - so thoughtful. The Turkish Air Force really couldn't have been more helpful and were great hosts.

The day started with a tour of the active aircraft pans to allow close-up pictures of the participating aircraft. We then moved to the side of the dispersal area and taxi way as the aircraft started to move out. Although there seemed an inexhaustible supply of young servicemen to 'police' the spectator areas, they all seemed good humoured and understood that the spectators were all keen to get the best shots.

Later we moved to the edge of the active runway, most unusual to be allowed so close. The tension when the F4s came out from the dispersal was electrifying and palpable. I thought I was excited, but I will forever remember a large Turkish gentleman standing behind me booming out when he saw it approaching "PHAAANTOOOOOME" he screeched. It was then I realised

Azerbaijan Su-25 Frogfoots conducting a 'pairs take off' for an afternoon sortie. © Tim Smith

UAE F16, note the AGM-88 high speed anti radiation missiles under each wing. © Tim Smith

that my level of excitement paled in comparison. The Phantoms taking off were felt as much as heard, despite good quality electronic ear defenders. Yet even this must have been a fraction of the sensation on a flight deck when one thinks back to aircraft carrier operations. Looking at a Phantom hurtling down a runway through a 400 mm lens is quite a sensation, as it approaches and completely fills the viewfinder until just the air intake fills the frame!

After the seemingly endless supply of Turkish F16s plus the 'superstar' F4s with their dandy tail fin paint schemes, came the Azerbaijan Su-25 Frogfoots, yet more F16s from the United Arab Emirates and Pakistan, followed by Typhoons from Qatar. The whole day whizzed past.

The next two days were designated spotters' day where the general public attended, swelling the spectator numbers four-fold. The first aircraft to show was the Turkish AWACS E3 Wedgetail, the same type the RAF is acquiring to replace the E3D Sentry. The movements then followed a similar pattern to the previous day, F16s, F4s and Frogfoots with Typhoons from Qatar and the RAF. The Solo Turk F16 display aircraft was spectacular including lots of flares. Later in the day another TuAF F16 decided to 'out do' the Solo Turk and performed a breath takingly low pass (there is a video of this on YouTube by Dino van Doorn of GMAP who was standing next to me). The second spotters' day followed a similar schedule although the day started with a performance by the Solo Turk F16 and later in the day a display by The Turkish Stars display team.

I was so pleased to have invested in a pair of high-quality noise cancelling ear defenders. The F16s were particularly noisy especially as we were standing on the edge of the runways. (The F4s were of course completely 'off the scale'.)

The next day we started to wend our way home. Departure from Konya

Qatar Typhoon taking off. All these Qatari aircraft at Konya were less than one year old. © Tim Smith

Airport was not difficult as there are only two departure gates situated next to each other. We had a novel experience in Istanbul where we had a stop over as we waited for our Athens plane connection. As there was not enough time to go to a hotel, we booked into the Kepler Lounge in the airport to use one of their 'sleep pods' - very different.

Our stopover in Athens allowed us time to see the changing of the guard and ascend the Acropolis to visit the Parthenon (another one off the bucket list). We finally flew back to Bristol the next day, 'a good time having been had by all' with lots of memories of unforgettable experiences, definitely to be repeated next year.

An insanely low pass by a Turkish F16 just for the assembled crowd. We estimated the port wingtip to be no more than 20 to 25 feet off the ground. © Tim Smith

India's Aircraft Carriers - Part 2

By Chris Penney

India's two current carriers INS *Vikrant* and beyond INS *Vikramaditya*. © Indian Navy

We continue this article from the previous Jabberwock 113.

The Indian Navy's next aircraft carrier INS *Viraat* (meaning "Giant") had already seen extensive service with the Royal Navy as HMS *Hermes*. Purchased from the UK in 1986 she underwent a thorough overall and refurbishment at Devonport Dockyard before embarking her Indian crew for the delivery voyage to Bombay. *Viraat's* Air Group consisted of British Sea Harriers and Sea Kings and French licence built Allouette III utility helicopters, known in INAS service as the Chetak. *Viraat* served until 2016 and became a short-lived floating museum, before she was towed to the breaker's yard.

To supplement and ultimately replace *Viraat*, India procured an aircraft carrier from the Russian Navy. This was the *Admiral Gorshkov*, originally a *Kiev* class carrier decommissioned in 1996. After a long and troubled procurement and an extended refit, this vessel finally entered service in 2013 as the INS *Vikramaditya*. Along with the ship a Russian-designed Air Group was procured consisting of MiG-29K Fulcrum-D fighters and Kamov Ka-31 helicopters. The MiG-29K is a navalised version of the widely exported Russian fighter, with folding wings and reinforced landing gear; 12 single-seat and twin-seat aircraft being acquired. The ship was modified by the addition of arrester wires to

enable arrested landings but retained the Fulcrum's original short takeoff performance, to offer a Short Take Off But Arrested Landing (STOBAR) capability. *Vikramaditya* was formally commissioned at Severodvinsk in Russia on 16 November 2013 and will be replaced by India's second indigenous carrier when built around 2030.

The Navy's latest addition is the new 45,000-ton INS *Vikrant*. The first aircraft carrier to be entirely designed and built in India, at Cochin Shipyard in Kerala state, the latest *Vikrant* was commissioned in September 2022. Her role is reflected in her official designation as Indigenous Defence Ship (IDS). The ship has a pronounced "ski-jump" to operate aircraft in the STOBAR role. The ship is 860ft long, has 14 decks with five in her starboard flying control island and accommodates 1,700 officers and ratings. Powered by four General Electric LM 2500 gas turbines, she has a top speed of around 28 knots and endurance of over 7,500 nautical miles. She has a 12,500 m2 (135,000 sq ft) flight deck. Her original design concept was to be capable of operating Fulcrum-D interceptors as well as naval helicopters, including the Airborne Early Warning radar Ka-31 Helix, newly acquired ASW MH-60R Seahawks and HAL's utility Dhruv and its 13-tonne Multi-Role Helicopter under design. However, after a protracted selection process, the Indian Government has recently chosen France's Dassault Rafale M as its future carrier strike fighter. The Rafale's selection is the result of a competition between the F/A-18E Super Hornet and the naval Rafale M, which included testing to the Indian Navy's operational requirements with STOBAR flight trials ashore at INS *Hansa* naval air station in Goa. The defence deal is reported to consist of 22 Rafale M single seaters and four Rafale B twin seaters. The four Rafale jet trainers will not be capable of embarked operations.

Vikrant is first of a planned two ship class, the other being the future INS *Vishal*. The new carrier will serve with Eastern Naval Command initially operating from Chennai (formerly Madras). Since commissioning, extensive operational sea trials being undertaken include Air Certification and Flight Integration of her rotary and fixed wing aircraft. An important milestone in this phase was reached on 24 May 2023 with the maiden night landing.

INS *Viraat* served from 1987-2016. © IN

MiG-29KUB aboard INS *Vikrant*. © IN

Naval Aviator

By Chris Taylor
October Talk summarised by Malcolm Smith

Those who watched television in the 1970s may remember "Warship", a BBC series that depicted life on board the fictitious Royal Navy frigate HMS *Hero*.

Our speaker Chris Taylor showed a brief clip from this realistic series, in which the ratings of the ship's Wasp helicopter flight pulled the aircraft out of the hangar, spread the rotor blades and prepared it for flight. This was a nostalgic view for anybody associated with the diminutive Wasp aircraft of 829 Squadron and Chris was able to regale us with many anecdotes from those days. The TV series had been the catalyst that persuaded him to join the Navy, intending to become a helicopter pilot. He certainly achieved his ambition and claims to be the most experienced Test Pilot for the Lynx helicopter. He also claims to be the only qualified autogiro test pilot in Europe.

Chris said he had 400 types of aircraft in his logbook and showed his latest book "Naval Aviator", published by Pen & Sword. In response to the question as to why he wrote books, he said that his father had been a clerk in the RAF in 1921. He had suffered a stroke at the age of 60, which left him unable to speak. This sad event led Chris to start to write down anecdotes of his flying career in the RN. After failing to be offered a place to train as a pilot with the RAF, he joined the RN as a General List (career) officer and after completing training (which included a few hours flying the Chipmunk while he was at the Britannia Royal Naval College) he was appointed to a minesweeper, HMS *Monkton*, based in Hong Kong, for seagoing experience. His varied experiences there included attending a collision between a RN hovercraft and a Chinese patrol boat, which led to some tense hours faced with armed Chinese military before the situation was resolved peacefully.

Although his primary objective

was to qualify as a naval pilot, his status on the General List meant that Chris had to complete lengthy warfare training, including gaining a Bridge Watchkeeping Certificate. After a spell in a Trials Ship, HMS *Londonderry*, to gain his Offshore Navigation Certificate, he was eventually appointed to flying training and gained his wings in the Gazelle helicopter. Once qualified, he was appointed in June 1983 to 829 squadron at HMS *Osprey* (RNAS Portland). The squadron was the headquarters and training squadron for all the RN's Wasp flights, then embarked in *Tribal*, *Rothesay* and most of the *Leander* class frigates. Chris found that the Wasp a challenging aircraft to fly and thought it was probably over-powered for its role. With only five hours experience, he suffered a partial engine failure on taking off on a training sortie from a ship's deck and ditched in (fortunately) calm water.

Once qualified as a Wasp pilot, Chris was appointed to HMS *Plymouth*, where he was quickly introduced to the complexities of flying the Wasp in challenging circumstances. When tasked to lift an underslung load, which proved to be overweight, he overstressed the aircraft's gearbox, leading to his having to submit ("render" in naval parlance) an accident report, known as the A25*. Later, when assisting the Officer of the Watch with the ship steaming in thick fog in the Baltic in company with other NATO vessels, he had to give the rarely-used command "Full astern both engines" to reduce the effects of a collision with a German frigate.

Chris was next appointed to command HMS *Aurora* flight, but was almost immediately told to switch to HMS *Diomede*, temporarily without a flight commander, for a journey to the Falklands Islands. He had an eventful trip to the South Atlantic, arriving in February and then hitching a ride in a Hercules back to the UK. Returned to *Aurora*, Chris had an enjoyable tour, with the ship in home waters before deploying to the Mediterranean.

Having regaled us with many Wasp anecdotes, Chris said that in 1986 he was sent to join 702 Squadron at Portland for conversion to the Lynx. Once qualified, he was appointed to HMS *Penelope*, but before joining this ship he had a brief spell in HMS *Arrow*, which had been tasked to support the transit of HMS *Warrior* from its refit in Sunderland to Portsmouth. Chris was in *Penelope* when she was involved in a serious collision with a Canadian refuelling tanker and showed some dramatic pictures of the event.

This summary does not do justice to the flow of stories from Chris. Much more detail can be found in his book "Naval Aviator", which supplies the background to his many experiences.

*** Hence the lines from the FAA songbook: "Cracking show, I'm alive/and I still haven't rendered my A25"**

Early aero engines 1900 - 1920

By Graham Mottram
November Talk summarised by Robert Heath

Our speaker has had a long-standing interest in early aero engines and he used as an example an authentic Clerget rotary engine.

He told us that automobile engines provide the basis for aero engine designs. In 1861, Nicolaus Otto developed the first four-stroke internal combustion engine, the precursor to the liquid fuelled engines with which we are now familiar. Ten years later, another German engineer, Carl Benz, developed his own two-stroke engine, incorporating many features we now take for granted, including speed regulation system, battery-powered ignition, spark plug and clutch.

In the USA, Professor of Aerodynamics Samual Pierpont Langley was contracted to build a piloted, heavier-than-air craft. His models were successful, but a full-scale flight eluded him. The Wright brothers made a controlled flight in 1903, using a 12hp engine of their own design. Langley next built the 'Aerodrome' aircraft, powered by a 50hp 5-cylinder radial engine designed by engineer Charles Manly, which also failed to fly. Shortly afterwards, in 1909, Louis Blériot famously made the first flight across the English Channel, using a radial 3 cylinder Anzani 25-30hp engine.

Early air-cooled engines were prone to overheating. Good, water-cooled engines were being built, including the French 50hp V8 Antoinette and the British Wolseley 60 hp, but water cooling added weight, limiting their applicability to aviation. Designers realised that better cooling could be achieved by increasing the flow of air over the cylinder heads by fixing the crankshaft and rotating the cylinders themselves. The French Gnome engineering company introduced the 7-cylinder rotary Monosoupape (meaning single valve) engine around 1910 and a Farman aircraft fitted with the Monosoupape won every race it entered.

We saw a film with a gentleman in the USA opening the bonnet of his 1905 era Adams-Farwell car and starting the

5-cylinder rotary engine - "spins like a top" he said. Graham explained that conventional in-line engines set-up a harmonic vibration and to overcome this a flywheel is required, adding weight. By rotating the crankcase and cylinder heads the flywheel effect was achieved with less weight. Additionally, the rotating engine improved cylinder cooling. The engine rotated around the centre of the crankcase while the hub for the piston crankshafts was slightly offset, allowing the pistons to complete their stroke as the engine rotated. Cylinders were always odd numbers and the engine fired on every other cylinder to ensure smooth running.

On the Clerget engine, each of the nine cylinders. Including cooling fins, was machined from a single billet of metal. The HT voltage spark was generated via a rotating Paxolin disc brushing against a fixed magneto. The carburettor was fixed at the end of the crankshaft (which is fixed to the aircraft) and fuel flowed through the hollow crankshaft to each cylinder. Lubrication was by a castor oil total loss system, which sent oil vapour back over the pilot, guaranteeing he would not suffer constipation! The gyroscopic loading of 1/2 ton of engine spinning at the front of the aircraft had a considerable effect on aerodynamic controllability.

In 1913 the engineer W O Bentley encountered the use of aluminium alloy in piston manufacture, making them lighter. Aluminium is a good conductor of heat, so that engines ran cooler, improving power output. Bentley re-designed a Clerget engine and created the more powerful, 9-cylinder, 230hp Bentley BR2 engine, which was fitted to several aircraft types including the Sopwith Snipe. Our speaker believes that the Sopwith Baby aircraft in the FAAM is fitted with an early 'hybrid' proof-of-concept Bentley engine.

In 1912, Peugeot built an engine with overhead valves and camshafts and Mercedes subsequently built six successful racing cars using their own version of a similar engine. One of the winning cars was sent to Mercedes in London, where Bentley found it and eventually developed it into the Silver Ghost engine. The USA found itself incapable of successfully building foreign engines, so they created the 400hp, 45° V12 Liberty engine, which was used in several aircraft, including the DH9.

In comparing the merits of in-line versus radial engines, Graham responded that there is no simple answer. The USA favoured radial engines in WW2 and they proved to be robust and reliable. However, it was easier to develop more power on in-line engine designs, whereas radial engines could only increase complexity by adding more and more rows of cylinders. The six P&W R4360 radial engines in the Convair B36 bomber had four 9-cylinder rows, with over 300 spark plugs. In the UK, Bristol produced the mighty Bristol Centaurus radial - described by some as a 2000hp Swiss watch.

Aero-engines are a fascinating subject, so a big thank you to Graham Mottram for a well-illustrated and absorbing talk on a complex subject.

Future Talks

By Richard Macauley

Though a little late, may I wish everyone a Happy New Year, all the more so as we have an excellent group of speakers lined up in 2024 for your enjoyment.

As a follow on from the last Jabberwock, the whole of 2024 is listed here. If you are unable to visit the Fleet Air Arm Museum to attend these Talks, please consider our Zoom alternative. If you haven't used Zoom before, it is very easy to set up on your computer or iPad/Tablet or even your smart phone. I will be pleased to send you a set of simple instructions of how to set up Zoom on your chosen computing device and talk you through the process over the phone and do a simple test to ensure everything works. Contact me by phoning **07768 562976** or email **soffaam@btinternet.com**

Please do consider the Zoom option so you can join in with our Talks programme. We have 3 slots filled already for 2025 so don't miss out by not having Zoom.

Thursday 25 January 2024
Mike Morison with the introduction of the Apache AH64D to service.

Thursday 29 February 2024
Joe Marsden – Flying the Vulcan in the Maritime Reconnaissance role.

Thursday 28 March 2024
SBS Veterans and Robert Brooke – SBS Operations in the Falklands Conflict.

Thursday 25 April 2024
Sue Adcock – The RAF Institute of Aviation Medicine, Farnborough

Thursday 30 May 2024
99th Expeditionary Reconnaissance Squadron and U2 ops at RAF Fairford

Thursday 27 June 2024
David Hassard – "Bat boat to Red Arrows", the story of Hawker Aviation at Kingston

Thursday 25 July 2024
Iain Ballantyne – 'Undersea' in the Cold War

Thursday 26 September 2024
Gp Capt (retd) Jock Heron – Military Aircraft Procurement Decisions and Follies

Thursday 31 October 2024
Alistair Hodgson – de Havilland Comet 75th Anniversary

Thursday 28 November 2024
Paul Hurt – The 'Lizzie' (Lysander) and Westlands

See the SoFFAAM website for more details on our speakers which is updated as each particular Talk draws closer.
www.fleetairarmfriends.org.uk/talks

If you have any questions about talks or have any suggestions, please contact me as in the 2nd paragraph.

The
Great War Aviation Society
The specialists in WW1 aviation

2024 ONLINE EVENTS PROGRAMME

Our events programme is free for GWAS members, or £5 per event for guests. Find out more at www.crossandcockade.com

Breaking Racial Barriers in the Air
Jon Guttman

Farnborough's FEE: the first M.R.C.A
Paul R. Hare

Bristol Scout 1264: Rebuilding Granddad's Aircraft
David Bremner

Dark Aces
Michael Terry

The Poor Bloody Observer
Peter Rowbottom

The Nieuport company until 1918
David Méchin

Navy Wings Visit October 2023

By David Merrett

On a crisp, clear day in October, two groups of SoFFAAM members, one morning, one afternoon, visited Navy Wings based at RNAS Yeovilton.

Navy Wings operates a working hangar so maintenance and engineering were at the top of most of our minds.

We assembled at FAAM and were escorted across to the far side of the vast establishment that is Yeovilton. The thrill of driving across a live military airfield with Wildcats (in late afternoon one manoeuvring quite close to the perimeter with an underslung load) Merlins, Prefects and the odd Falcon F20 from Draken all buzzing around was a visit in itself.

There was so much to see, smell, touch and enjoy. Sea Fury VR930 as we had never seen her before with her pristine Bristol Centaurus engine to one side and her five bladed propeller all wrapped up for Christmas.

Sea Hawk WV908 was not quite as disassembled as the Sea Fury and impressed with the beautiful engineering of her Nene engine blade roots.

For some, seeing a totally naked Swordfish was a unique experience, an amazing fusion of simplicity and complexity.

The lunchtime crossover in Warnefords provided time to meet old friends, chat and share experiences.

The only shared sadness was the number of seemingly "abandoned" aircraft on the airfield, numerous Harriers and, of course DH Sea Vixen XP924 "Foxy Lady", awaiting road transport to her final destination.

A very special visit and all of our thanks to Katie Campbell and Paige and all of the engineers who took time to engage with the members of our group and not forgetting Rosanne who organised it all.

SoFFAAM Christmas Lunch

By Richard Macauley

SoFFAAM Members, partners and guests convened at the Long Sutton Golf Club on 13/01/24 for our annual Christmas Luncheon.

After grace was said, a delicious meal followed of traditional turkey or beef, finished off with a choice of dessert, coffee and mince pies.

Our Chairman Malcolm delivered a sincere resumé of the healthy condition of SoFFAAM and then came the quiz. Always aviation themed and this year's quiz master thought aircraft related news of last year and aircraft in films would hit the mark. It certainly caused much conferring among the teams but I fear the compiler may now have a price on his head? An extensive raffle ensued to round off our very enjoyable annual lunch. Do consider joining in next year, it really is a most convivial few hours of good food with good friends.

Thanks again to Rosanne for organising the whole event plus procuring all the raffle prizes - every organisation needs a 'Rosanne'!

Membership

By David Merrett

A big WELCOME to the new members who have joined us since the last journal issue:

3857	**Mr K Beattie**	Somerset
3858	**Mr M Houghton**	Dorset
3859	**Mr R Lambourne**	Dorset
3860	**Mr T Endsor**	Devon
3861	**Mr P Knox**	Dorset
3862	**Mr A Grattan-Cooper**	Dorset
3863	**Mr D Bird**	Gloucestershire
3864	**Mr C Wardle**	Dorset
3865	**Mr S Gould**	Somerset
3866	**Mr F Masters**	Somerset
3867	**Mr J Andrews**	Devon
3868	**Mr D Heath**	Derbyshire
3869	**Mr S George**	Somerset
3870	**Mr T Rees**	North Yorkshire
3871	**Ms K Lynes**	Somerset
3872	**Mr D Cormack**	Cornwall
3873	**Mr D Keady**	Somerset
3874	**Mr S Bennett**	Somerset
3875	**Mr S Fox**	Northamptonshire
3876	**Mr M Coleman**	Hampshire
3877	**Mr A Kirby**	Dorset
3878	**Dr S Wood**	Dorset

Total members as of 08/01/24: 952

Members who have made a Gift Aid declaration: 722*

*Opting to Gift Aid allows us to claim an extra 25% of your subscription from HMRC

An important update: We no longer issue membership cards. On arrival at the Fleet Air Arm Museum, please tell the reception staff that you are a SoFFAAM member and they will find you on the SoFFAAM membership list. Please ensure that your subscriptions are up to date otherwise your name will not appear on the list and you will be charged for admission.

"Going Green" and receiving a PDF Jabberwock via your e-mail saves us around £9 per member, per annum. Thank you to those who switched recently!

This is much appreciated and very easy to change over to PDF – just drop us an email at **soffaam.mem@gmail.com** for this and all other membership queries.

Visit us at: www.fleetairarmfriends.org.uk

Membership Application

I hereby apply for membership of SoFFAAM (the Society) and will pay via:

☐ Bank Standing Order

☐ BACS transfer, bank details in orange block, payment ref. "(your surname) MEMBS"

☐ PayPal using soffaam.joinup@gmail.com

☐ Cheque, made payable to SoFFAAM

Individual Adult Membership UK (age 16+) **£14.00** ..... ☐
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We have a robust data protection policy. GDPR compliance can be viewed on the Society's Website.

809 Naval Air Squadron stands up

A second frontline F35B Lightning squadron has stood up at RAF Marham. Known as the Immortals, 809 Naval Air Squadron has a long and distinguished history and has recommissioned as the nation's second front-line F35B unit. Commander Nick Smith formally received the Squadron Crest from his predecessor, Cdr (Ret'd) Tim Gedge, close to 41 years to the day since 809 Naval Air Squadron decommissioned as a Sea Harrier squadron.

All photos are UK MoD