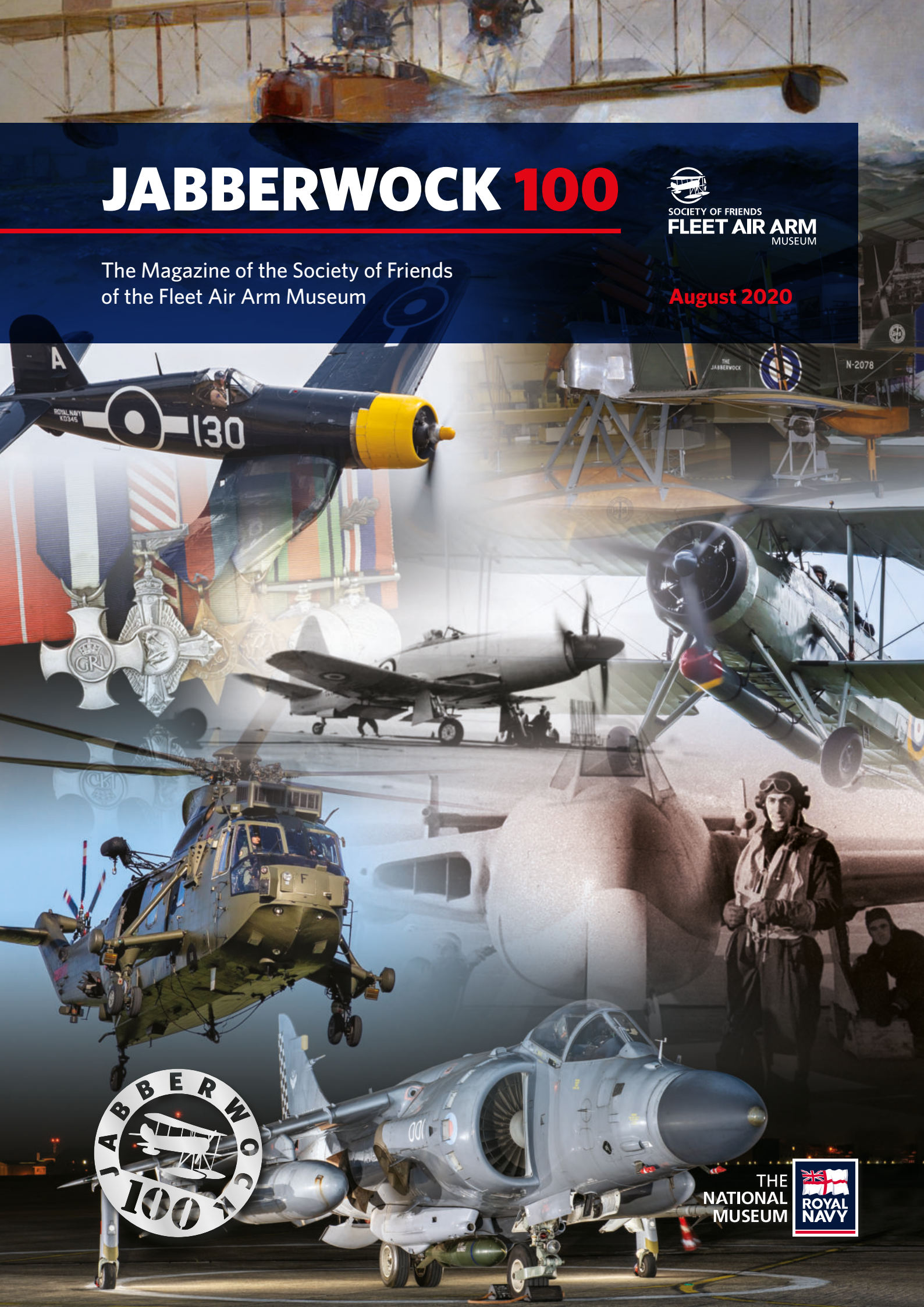
JABBERWOCK 100

SOCIETY OF FRIENDS
FLEET AIR ARM
MUSEUM

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

August 2020



THE
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NAVY

The Society of Friends of the Fleet Air Arm Museum

SOCIETY OF FRIENDS
FLEET AIR ARM
MUSEUM

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shalefan@btinternet.com

Vice Chairman
Ivan Childs
ivan.childs@tiscali.co.uk

Secretary
Malcolm Smith
smalcolm355@outlook.com

Treasurer
Martin Turner
martinturner111@yahoo.co.uk

Membership Secretary
Simon Websper
22 Kings Yard,
Bishops Lydeard,
Taunton, TA4 3LE.
M: 07527 707204
soffaam.mem@gmail.com

Events Organiser
Rosanne Crowther T: 01935 822143
rosannecrowther678@btinternet.com

Talks Committee
Richard Macauley
richard.macauley1@btinternet.com
T: 01278 683300 M: 07768562976

Gil Johnston
flyingflea@live.com.au

Tim Smith
timsmith555@hotmail.co.uk

Editor
Malcolm Smith
T: 01935 478304 M: 07765 950806
smalcolm355@outlook.com

Council Members


Graham Mottram


Ivan Childs


Malcolm Smith


Martin Turner


Simon Websper


Chris Adams


Rosanne Crowther


Robert Heath


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Richard Macauley


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Contributions
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, on production of a valid membership card. Members may be accompanied by up to three guests (one guest only for junior members) on any one visit, each at a reduced entrance fee, currently 50% of the standard price. Members are also allowed a 10% discount on goods purchased from the shop.
Note: These concessions are provided at the discretion of the General Manager of the Museum and could be removed at any time.

FLEET AIR ARM MUSEUM
RNAS Yeovilton, Somerset BA22 8HT
Telephone: 01935 840565

Registered Charity No. 280725

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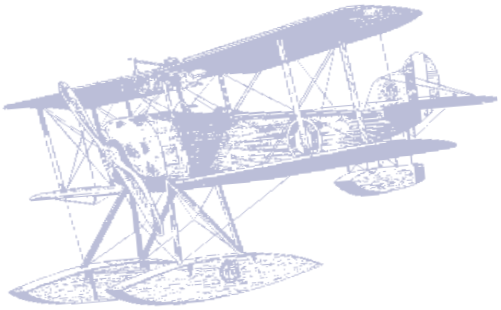

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Contact the Society

SoFFAAM email:
soffaam.mem@gmail.com

SoFFAAM website:
www.fleetairarmfriends.org.uk

Visit us on Facebook
@SOFFAAM

Visit us on Instagram
Fleet Air Arm Friends

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Cover image
A photo montage of aircraft and artifacts from the Fleet Air Arm Museum and other timelines of the Royal Navy and the Fleet Air Arm over the years.

A message from the President

Rear Admiral Tom Cunningham CBE

Dear Friends,

As your recently in post President, I am both delighted and honoured to write the introduction to the 100th edition of Jabberwock

Firstly, may I thank you all for your interest in, and support of, the FAAM. After 35 years in the Navy as a FAA Observer I am passionate about our UK maritime aviation heritage. I have been the Head of the FAA and Chairman of the FAAM and I remain Chairman of The Fly Navy Heritage Trust and Honorary President of the Fleet Air Arm Association. Hence, I am acutely aware of the challenges not only in preserving that heritage but also in educating people on it in the first place. The Museum plays a key role in doing just that.

There is much indeed to celebrate and to be proud of in the UK's role in pioneering maritime aviation from as early as 1909, including:

- The Royal Naval Air Service's pioneering contribution in WWI, including air defence of the UK, strategic bombing and the introduction of aircraft carriers;
- The technical innovations, still used around the world, that enabled jet powered operations at sea;
- Helicopter operations, including the largely unrecognised innovations from Westland Helicopters, just down the road, proven in the Wasp that made the Lynx the most capable small ship deck operating helicopter in the world.

We all look forward to the Museum's reopening and the resumption of our SOFFAAM talks and visits whereby we can maintain momentum and hopefully build the SOFFAAM membership. It is inevitable that in a financially constrained post-Covid environment the Museum will rely increasingly on Friends of all persuasions to face the future. I am sure that we will play our part in continuing to highlight the UK's proud maritime aviation heritage.

Thank you again for all that you do and I look forward to meeting more of you soon.

Rear Admiral Tom Cunningham CBE

Editorial

Welcome to this special 100th edition of Jabberwock! On this occasion, we have chosen a larger format, but plan to revert to our normal A5 size for future issues. The new professional appearance of the magazine has been enabled by your Editor's handing over responsibility for its format to Council member Richard Macauley.

We write as the country emerges from the Covid 19 health crisis, during which dreary time the Museum has been closed and Society activities have been put on hold. In this edition, we hold out hope that our monthly talks may re-start later in the year, but all will depend upon the Museum opening for business again and Government policy on gatherings and meetings of every sort.

This 100th issue looks back over the years to the first Society Newsletter, produced in December 1979, when the Society's Patron was Admiral of the Fleet Sir Caspar John GCB. Our present Chairman, Graham Mottram, provides a brief history of the Society and describes how it has evolved over the years. As there have sadly been no recent talks to review, we provide summaries of notable talks of previous years. As always, we include readers' letters and numerous new articles, also a challenging quiz. There are no prizes for identifying all the various items so carefully photographed by Gil Johnston, but we challenge you to identify every one before looking up the answers!

We include a summary of the recent Council meeting, held for the first time as a virtual event. Readers will see that we are placing continuing emphasis on publicity and marketing and hope to extend our membership base to include younger members and families. This is partly in response to the slow but steady decline in our membership numbers, but also because we plan to reach out to a wider audience.

The small photograph in Jabberwock 99 of a reader's father in an unidentified aircraft carrier at Cape Town has provoked a couple of responses. These do not completely solve the small mystery, but remind us of historical events towards the end of World War II. We often remark that it is contributions such as these that continue to make our magazine interesting and enjoyable. All readers' letters are welcome and we aim to print as many as possible.

Malcolm Smith, Editor

Annual General Meeting

The AGM will be held on Thursday 24 September 2020 starting at 7.00pm

As usual, the meeting will hear reports from Council members and there will be a vote for council membership.

Because of the continuing restrictions on public meetings, this will be a virtual meeting, held on Zoom, the online conference call facility. All are welcome to partake. If you wish to do so, you will need to download the Zoom application: https://zoom.us/download (this is free to users). Send an email with your name and membership number, requesting to join the meeting to the Secretary on smalcolm355@outlook.com. This must be done by 7.00pm on Wednesday 23 September 2020, you will then receive an email invitation.

Letters to the EDITOR

Hello Malcolm,

Jabberwock No.98 (Feb 2020) had an interesting article by Chris Howat on RNAS Tiree, with his time on 819 Squadron at Prestwick (*HMS Gannet*) and the ferry salvage using empty oil drums, both of which reminded me of a couple of stories whilst I served in the FAA.

In 1960 when *HMS Centaur* went to Invergordon for a weekend, we couldn't go alongside and the Captain (Horace Law) wanted the ship's Land Rover ashore. No suitable vessels were available to take the Land Rover from ship to shore, so the 'steamies' said they would make a raft. They made a metal platform and welded empty oil drums to it, fixed on wooden deck and a canvas cover, lovely job. It was decided to load the Land Rover on to the raft, whilst on the flight deck, then using the ship's crane lower the whole thing over the side into the water. Great! Crane lifts away and lowers everything down, the raft lands on the water, seems to settle nicely so they keep lowering away. The water starts coming up around the canvas cover, and the raft doesn't seem to be floating so they start hauling back up. The crane feels quite a strain, as the load seems heavier. As the raft and drums clear the water, water can be seen pouring out of the oil drums. The "steamies" had forgotten to put the bungs back into the oil drums after welding.

Fun story to finish, about Invergordon. Scotland used to 'shut down' on a Sunday, nothing opened, no pubs etc.. One of my Scottish friends told me he knew where to get beer and food on a Sunday if I went ashore with him. We had to go to church (which I was happy with) but didn't realise the Service lasted for three hours. After the Service we retired to the marquee behind the Church for free beer and sandwiches.

Regards,
Derek Poulton

Dear Malcolm,

Owing to the Coronavirus emergency I have only just received my copy of Jabberwock 99. I believe I may be able to help with identities for the mystery photos.

Firstly the carrier photo (p.7). The shield shape, gun barrel size and above all the blast bags of the gun mount all suggest to me that this is a Mk.XIX twin 4" mount. These were only fitted in such a location to one carrier: the maintenance carrier *HMS Unicorn*. The location of the raised "hockey stick" radio mast and the crane jib (actually mounted on a sponson on the ship's side) all fit with this identification.
https://www.armouredcarriers.com/hms-unicorn-maintenance-support

The fly in the ointment is that I can find no record of *Unicorn's* ever having visited Capetown. However, according to Wikipedia, she was ordered to Durban, South Africa on 7 November 1944 for a minor refit and left there on 1 January 1945 to join the British Pacific Fleet. Could it be that the location is Durban, rather than Capetown?

Secondly the Hellcat FB.II on p.8: from the alleged location and the code presentation on the undercarriage doors I believe this may be an aircraft of 896 Squadron. A photograph of Hellcat FB.II "2AB", similarly RP-armed, of 896 Sq at Wingfield South Africa appears on p.330 of The Squadrons of the Fleet Air Arm 2nd Ed. Unfortunately the undercarriage doors are not visible so we cannot see whether the code presentation is as for "AA".

896 Sq arrived at Wingfield on 5 Jan 1945 and re-formed as a single seat fighter squadron on 9 January. In April 45 896 embarked in *HMS Ameer* and sailed for Ceylon. I am wondering if the word read as "*Ahben*" may in fact be "*Ameer*": 2 of the 5 letters are the same! A possible argument against my suggested identity is that "AA" is much more worn (exhaust stains) than the freshly issued "2AB": maybe the photo was just taken later.

Given time, I ought to be able to have a reasonable stab at identifying Hellcat "3X" also shown on p.7: if I do, I will be in touch again.

Thank you for editing Jabberwock and in particular for publishing rare photos such as these: it's the reason I took out a subscription!

Best wishes,
Nick Carlyon (2979)

PS: Further to the photo of Hellcat 3-X on p.7 of Jabberwock 99, as far as I can glean from Theo Ballance's Squadrons and Units of the FAA the only Hellcat to wear 3 as a squadron symbol was 898 Sqn. This re-formed at Wingfield, Capetown, on 8 Jan 1945 with 24 Hellcat IIs and embarked in *Attacker* for Ceylon in June 1945. Both location and date fit the limited information we have. Ballance's book shows (p.270) a line-up of shiny new 898 Sq Hellcat IIs in Sea Blue Gloss at Katakurunda, Ceylon in 1945. At first glance the aircraft shown in the Jabberwock photo appears to be in the earlier Temperate Sea Scheme and was probably being used during the squadron's work-up.

Dear Editor,

I did enjoy your review of the book on torpedo aircraft in Jabberwock 99. I have always admired the Bristol aircraft such as the Beaufort and Beaufighter, which the author mentions. Those Bristol aircraft were effective anti-shipping machines, but if they "ditched" when damaged, i.e., crashed into the sea, they had a terrible reputation for sinking almost immediately, dragged under by the weight of the two engines and taking their aircrew with them. Reading about them reminds me of the poem "When a Beau goes in" by Gavin Ewart. The last lines of the poem read: "It's not original sin; it's only a Beau going in."

Keep up the good work.

Sincerely,
Trevor Robert Harris
Bournemouth

When a Beau goes in,
Into the drink,
It makes you think,
Because, you see, they always sink
But nobody says "Poor lad"
Or goes about looking sad
Because, you see, it's war,
It's the unalterable law.

Although it's perfectly certain
The pilot's gone for a Burton
And the observer too
It's nothing to do with you
And if they both should go
To a land where falls no rain nor hail nor driven snow —
Here, there, or anywhere,
Do you suppose they care?

You shouldn't cry
Or say a prayer or sigh.
In the cold sea, in the dark
It isn't a lark
But it isn't Original Sin —
It's just a Beau going in.

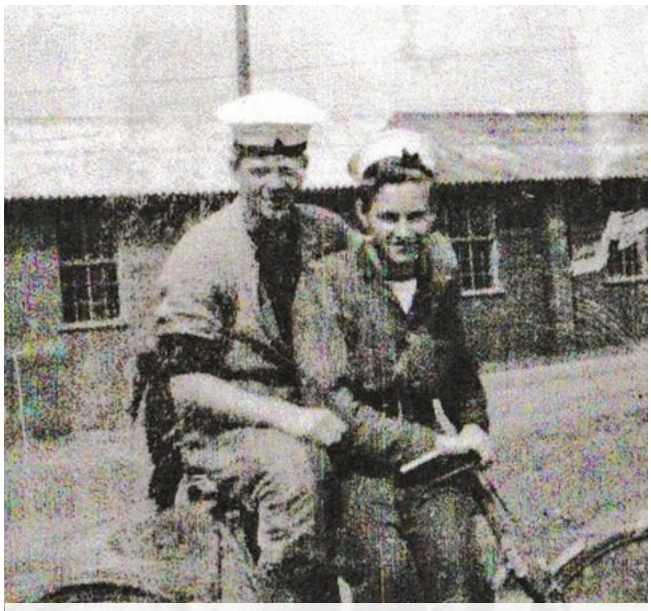
Gavin Ewart

From the Editor

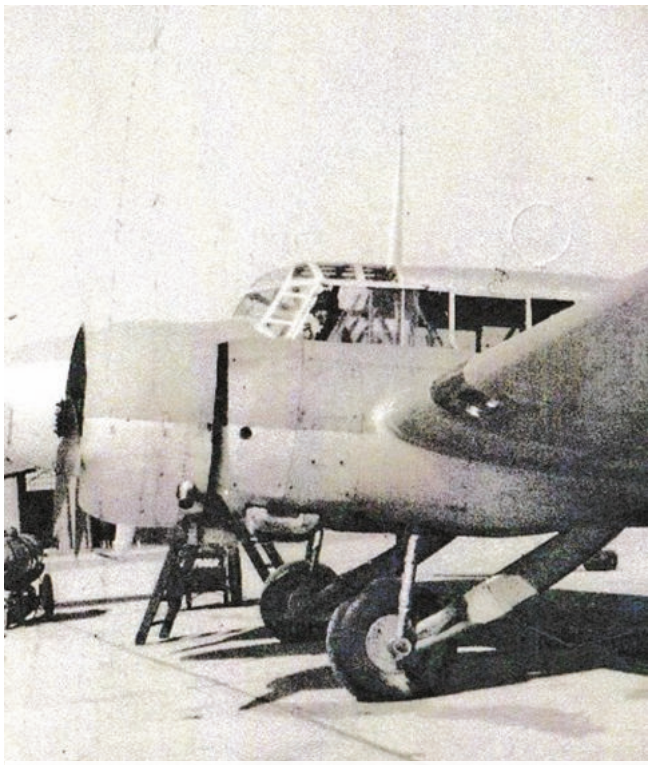
Pauline Ganders letter in the last edition (Jabberwock 99, May 2020), describes her father, Harry Barber and his time in Cape Town, South Africa

Harry loved his time there during 1945 and as a follow on, Pauline has kindly sent two further photographs of her father, taken from a very extensive collection.

As you will see in the second photo caption, Pauline does not know the aircraft type. However, I am sure our readership will be able to form a positive identification? Unfortunately no markings are visible to assist a more detailed identity - all comments welcome.



Pauline's father and friend during basic training.



Pauline's father in the cockpit of an unidentified (South African?) aircraft.

Dear Editor,

A 100 up - congratulations on a magnificent century! The Society should be justly proud of Jabberwock's 100th edition. Keep up the title's great work it's maturing nicely.

This RAF Museum Hendon first day cover was flown by the British Forces Postal Service at Mach 1+ in Yeovilton's Concorde 002 G-BSST (for British Super Sonic Transport) during a test flight that included an appearance over Farnborough on 7th September 1970. The Mach 2-capable engines were developed from the RAF's ill-fated BAC TSR2 low level nuclear bomber.

It's a reminder of just how far military aviation has come since those heady days of 1912 and the Royal Flying Corps Central Flying School's formation at Upavon. Although the Royal Naval Air Service didn't come into being until 1914 it was a Royal Navy Officer, Captain Godfrey Paine, who became the School's first commandant. He later went on to become Fifth Sea Lord taking overall responsibility for naval aviation. Given the RNAS connection I'd better donate it to the Museum!

It's interesting to note that the national flags of both the UK and France on the Royal Mail stamp are shown flying from the starboard side. These are not upside down but follow the traditional protocol of being flown at the nose of an aircraft from the days when pennants and flags were hoisted above an airliner's flight deck when on the ground.

Best wishes,

Chris Penney

Concorde 002 G-BSST landing at Farnborough. This is the same aircraft that now resides in the Fleet Air Arm Museum, Yeovilton.

Dear Malcolm,

I am attaching an account of a bit of history arising from the letters in Jabberwock 99 which readers might find interesting. As I have probably told you in the past, one of my friends was in the reformation of 804 Squadron in September 1944 and it was he who told me about the "driving" of their Hellcats through the streets of Cape Town to the Wingfield airfield. What a sight and sound that must have been for the good people of Cape Town. History books don't tell you things like that.

It was odd that the East Indies Fleet (EIF) never used 898 in operations. There may be a story there. Between August and October 1944 the two *Illustrious* squadrons of Corsairs, nos. 1830 and 1833, were disembarked to Wingfield so the air around Cape Town during the last few months of 1944 must have been very busy - great for plane spotters!

Keep up the good work with Jabberwock. It is, I think, now a serious magazine.

Regards,
Hugh Langrishe
Member no. 148

Minor mysteries – Hellcats at Wingfield, Cape Town

By Hugh Langrishe

For nine months between September 1944 and June 1945 the skies around Cape Town were filled with the thunder of the Double Wasp engines of Hellcat IIs. Three squadrons were trooped out from the UK, collected their mostly new Hellcat II when they arrived at Wingfield and were officially formed. They were destined for escort carriers of the East Indies Fleet (EIF).

804 Squadron formed on 7 September 1944, receiving a shipment of 24 brand new Hellcat IIs which were delivered by *HMS Thane* direct from New York on her only visit to Cape Town. So urgent was it to start flying that the aircraft were taxied with their wings folded by the pilots on the public streets through Cape Town to RNAS Wingfield, at that time on the NE edge of the city. Many of the pilots were only recently out of operational training so this must have been a strange introduction to working up. 804 Squadron departed for Colombo in *HMS Ameer* on 4 January 1945 with another set of new Hellcats, arriving on 10 March. They had a busy time over the Indian Ocean, flying from *Empress*, *Shah*, *Emperor* and *Ameer*. The squadron left its aircraft and returned home, disbanding on 18 November 1945. 804 aircraft were identified by a white ring around the front lip of the engine cowling and a horizontal white band across the tail.

Next to form at Wingfield was 898 Squadron, on 8 January 1945. They finally departed on 23 June 1945 in *HMS Attacker* for Ceylon. Although the squadron spent a few days on *Pursuer*, probably practising deck landing, they never saw action. The squadron was shipped home in the same ship without aircraft and was disbanded on 12 December 1945.

The last of the three squadrons was 896. Personnel arrived in Cape Town on 6 January 1945 and the squadron formed on 9 January. There must have been some urgency in the working-up programme because the squadron departed in *HMS Ameer* on 24 April, flying to their ship from the airfield at Stamford Hill, Durban. The squadron conducted operations from *Ameer* in July over the Indian Ocean but subsequently flew from *Empress* until after VJ-Day, finally leaving their aircraft and returning home in *Ameer* for disbandment in the UK on 19 December 1945. Squadron aircraft were identified by a dark band around the front of the engine cowling.

Connecting all this to the picture of the Hellcat on its belly in Jabberwock 99, I am reasonably certain that this is at Wingfield and is of an aircraft of 896 Sqn. and therefore would have been taken during the first four months of April. I am not sufficiently knowledgeable to identify the carrier in the same group of photographs but it is safe to presume that it is *HMS Ameer*.

Checking various accounts I have been surprised to see that the aircraft delivered to Cape Town during the second half of 1944 were all painted in standard FAA camouflage. It had been early in 1944 that the USN adopted the overall Glossy Sea Blue for all their aircraft and this was accepted by the Royal Navy so that the finishing process was not delayed as RN aircraft came off the production line singly or in random batches amongst those for the USN. By the end of 1944 I was in Australia with MONAB 1 and in February 1945 and beyond. After we had finally exhausted the camouflaged replacement aircraft ferried from the UK and Ceylon or India, we received dark blue Hellcat IIs direct from the U.S. – as well as a few from Ceylon.

804Sqn Grumman Hellcats on board *HMS Ameer*. © *asisbiz*

Report on Virtual Council Meeting

By the Secretary

Because of the Coronavirus-19 health emergency, this was a virtual meeting, held via Zoom, the on-line conferencing facility.

The Chairman provided the following report;

The Secretary had circulated suggested minor amendment to the Constitution to reflect the intention to hold virtual General Meetings. He commented that the amendments would allow the Society to hold a virtual AGM, but did not fully answer such questions as how members would be informed of the meeting and be enabled to vote on any motions that arose, in particular the annual vote on elections to the Council. The Secretary commented that the AGM would be announced as usual in the August Jabberwock. It would be possible to hold an electronic voting process by which all interested members could vote. It was agreed that this did not fully satisfy the outstanding issues, such as what constitutes a legal definition of "attendance".

The Chairman said that the matter needed further consideration.

The publicity and Recruitment members provided the following report:

Events. Air Day, Taunton Armed Forces Day and other promotional activities at planned events this summer have been cancelled due to foreseen circumstances!

Jabberwock. The Society has entered into reciprocal journal membership promotion advertisements with the Battle of Britain Society and Cross & Cockade. If you have a suggestion regarding any other societies we could approach please let me know.

Facebook. SOFFAAM has "liked" Cross & Cockade on Facebook and I've asked them if they'll like us. We've also "liked" NMRN and hope this would be reciprocated.

The main aim remains to keep FAAM at the forefront of everyone's minds during closure. Model maker Airfix has had a huge upswing in fortunes since lockdown and I'd be interested to hear ideas on how best we can market SOFFAAM to this (younger?) audience

Join Leaflet. Richard had produced a new design which needs some finessing and I will put this out for approval when completed.

The Visits organiser provided the following report:

What can I say other than there are none planned! There is nowhere open to visit, and I honestly don't think we will be able to consider a visit anywhere before late September/early October this year. Being realistic I would imagine April/May 2021 would be a good time to think about some sort of visit. Again, it will all depend on the quantity of people allowed into a venue at one time and the cost of a coach.

The planned visit to Tangmere was cancelled by the organisers, so that would be the first venue to consider. Langport and District History Society have offered us places on their coach trip to visit the Mary Rose, Portsmouth. This is now re-scheduled for 19th May 2021.

The Talks organiser provided the following report:

I have contacted each speaker a month ahead of their appointed date and cancelled their talk. So far, all the speakers have been understanding and have rebooked a slot for them in 2021. Therefore the 2021 Talks programme is already underway, along with potential new speakers also being identified. I will continue in this vein for the foreseeable future while FAAM is closed. For practical reasons this may continue beyond when FAAM re-opens. I say this because whatever the government guidelines maybe, official and personal 'Social Distancing' sensibilities may preclude a practical solution in holding a 'Talks gathering'. For myself, any attempt at anything other than our usual format is a non-starter, both financially and as an event.

The Membership Secretary provided the following report:

Facebook continues to create awareness of SOFFAAM, now with almost 460 followers and is proving a very good means of message communication with both existing and potential members. We also have 22 followers on Instagram.

We are planning to introduce a new member referral reward scheme, once life has become a little more normal. Perhaps pencil this in for the November Jabberwock. The appeal to members to switch to electronic Jabberwock has resulted in 16 switchers in the first week – hopefully a lot more to come.

The "Join" leaflet is being revamped, to be more eye-catching, with new Memsec details, junior membership ages and payment methods. PayPal has proved useful in a few cases now. The addition of a card payment facility would help greatly and bring us at least level with like-minded organisations. If a junior member has to be accompanied by an adult, then a family membership is always a better option.

New member questions have revealed that;

- Six joined because membership is value for money
- Two joined for access to talks
- Two joined to improve aircraft knowledge
- One for model research
- One for news of the museum.
- Eight new joiners' interests are stated as general and 1 each for engineering and science design, World War One interest, naval aviation, jets, simulators and 1950's/1960's aircraft.

The Chairman asked the Membership Secretary to produce a brief discussion paper on the subject of membership fees.

The following points arose under Any Other Business:

Regarding the website, Chris Penney remarked that Richard's report had not addressed the proposal to add a members-only area. He still thought that the site needed a re-design, although he understood that serious changes would incur additional expense.

After a discussion of the inclusion of various photographs of past and present officers of the Society, it was generally agreed that the title page of the magazine should include photographs of current Council members, also one of the President.

The Fleet Air Arm Museum and its Society of Friends

By Graham Mottram

The story of FAAM is inextricably linked to some of the great characters of the wartime generation of the FAA itself.

The motivation for the museum came from Rear Admiral Percy Gick who, as Flag Officer Naval Flying Training (FONFT), visited NAS Pensacola in the autumn of 1963 and observed the nascent naval aviation museum there. Convinced of the PR value of such an organisation, on his return to Yeovilton he tasked one of his staff, Keith Leppard, to draft a paper for the Admiralty Board. That paper obtained the Board's approval and, at the turn of 1963/64, Yeovilton's Air Engineering Officer, Cdr. Robin Foster, was lumbered with the job of creating the Fleet Air Arm Museum in Hangar 11 with about three months to complete the job.

Robin set to with a vengeance and so, when HRH Prince Philip visited RNAS Yeovilton to mark the 50th anniversary of the founding of the Royal Naval Air Service, his programme included the opening of the Museum. Although a charitable trust was established in 1966 FAAM was very much a department under command until Admiral John Treacher became Flag Officer Naval Air Command (FONAC) in 1972. Under Lt. Cdr. Les "Harpy" Cox, who had become Curator in 1966, the aircraft collection had grown substantially and many of them were outside, quietly corroding away. John Treacher told the trustees that they were facing a "crisis of corrosion" and that the trustee body needed to be widened to bring on board civilian trustees who had the financial connections to construct a fund raising appeal and build additional space to house the aircraft. It was at this point that people like Sir Donald Gosling, Bill Regan and Sam MacDonald Hall joined the board and put a fund raising campaign into operation. A

Development Director was appointed, one Cdr Dennis White, who would later be appointed Director and hold that post from 1976-87.

The major expansion was complete by 1980 although other aspects remained to be added, and Dennis had brought in Wing Cdr John Segar as Development Secretary to continue raising funds. Jackie Segar was Dennis White's PA for a few years and she and John retired around 1981. It was John who proposed forming a Society of Friends as a way of building a modest fund raising base. And so it was that on a freezing cold November 1979 afternoon that the founding meeting of SOFFAAM was held on the gallery which now holds the Swordfish/Battle of the Atlantic exhibition.

Dennis and John had recruited Rear Admiral Ray Rawbone to run the founding meeting, and Ken Hermon, Chief Executive of Yeovil District Council, to be the first Chairman. Admiral Ray had flown Seafires during WW2 and later been CO of *HMS Heron* and it is cheering to know that he will be reading Jabberwock 100. Ken Hermon died several years ago and there are only a few others who attended that founding meeting still around some 40 years later. Derek Moxley, Chris Adams, Ian MacKinnon and I are the ones I am certain of. Anyone at the meeting or who joined shortly after the founding meeting was granted a Membership Number of 100 or below. The first Patron was Admiral of the Fleet Sir Caspar John, and he was followed after his death in 1984 by Sir Basil Blackwell, at that time the Managing Director of Westland Helicopters. The President for a while was Admiral Sir John Treacher who was relieved by Admiral Rawbone in 1982.

I remember that what is now Hall 1 was rather empty for some time. One of the few aircraft in there was the Short S27 replica built by the last serving Director, Cdr Henry Leeves, but this must have been deemed too difficult, despite being the "earliest" aircraft in the collection, to act as the entrance icon, and so the Sopwith Baby, rebuilt at RNAY Fleetlands, was mounted on a plinth in the centre of what is now the shop. The rebuild had been given the identity of the aircraft flown by Flt. Lt. Gordon Hyams RNAS during WW1, who had christened his aircraft "The Jabberwock", the monstrous creature in Lewis Carroll's nonsense poem "Jabberwocky". I cannot remember if it was proposed at the founding meeting that an image of the Baby should be the Society's "brand icon", or whether that was decided later. It was then inevitable that the Society's magazine should have an image of the aircraft on its front cover and that

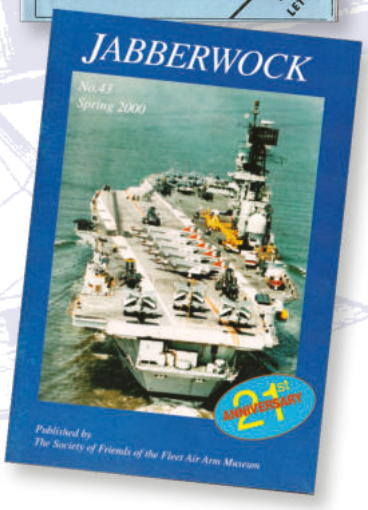
Initial issue of the Society's Constitutition.

The Newsletter appears in A5 format.

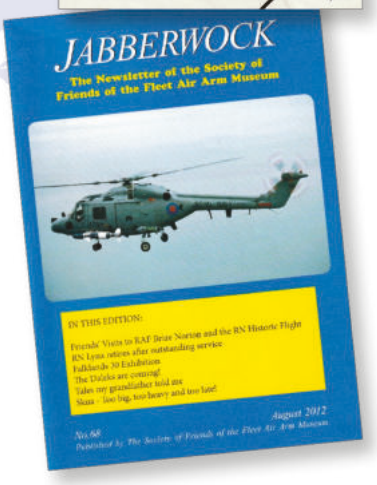
No 3, the first to appear with a formal cover.

The first photographic cover picture.

The cover bursts into colour!



Colour introduced throughout.



the publication should be known as "Jabberwock".

There is an enormous danger when reminiscing and trying to be accurate that memory will fail and that something important will be left out. I am taking that risk when embarking on a section about the people who helped SOFFAAM develop in its early days and who led Working Groups or held important roles in the Society. I am bound to leave someone out but it will be with no dreadful intent. Ken Hermon held the Chairmanship for several years and his deputy for much of that time was Ronnie Henton. John Segar filled the role of Treasurer and Jackie Segar was the Membership Secretary. The publishing side of the early Society was handled by Peter Hoskin, who was also the Society's Secretary. There were also four Working Groups. Group One was headed for a long time by Cyril Tubb, and ex-RAF Senior Technician who had, as a very young man, served on the last Schneider Trophy team. Their defined role was to help with the maintenance of exhibits but in reality they concentrated all their efforts on rebuilding the Sea Gladiator, which had arrived from the Shuttleworth Trust as a lorry load of bits. Group Two provided Museum Guides and Stewards, led by Ronnie Henton. Group Three was to help with the work of the Library and Archive team. I led that for a while, not very productively, and was eventually replaced by Peter Anderson who did a much better job. Group 4 did the organisation of social events and fundraising, headed by Jackie Segar. I have checked my facts in an early Jabberwock, which was edited by Peter Hoskin, who was also responsible for the News Letter. The Society had two publications, Jabberwock, which was meant to be the serious magazine, and the News Letter, which dealt with the more social stuff. In the beginning they were both basically photocopied and with a soft cover. Both acquired a blue card outer after a few editions, and then Jabberwock began to get more polished, quite literally because it now had a glossy blue cover, still with the Sopwith Baby as its focal point. The News Letter became the News Bulletin in 1986 and a slight improvement in quality, now being professionally printed and having a news photograph on the outer cover. It would definitely be a glaring omission if I did not mention Lt Cdr "Jan" Stuart whose retirement occupation was running the Skylark Press in Crewkerne and who helped to establish the "glossy" Jabberwock format. Jan was a great character, called a spade a poofter's shovel and is sadly missed by those who enjoyed his company and admired his utter devotion to all things Fleet Air Arm.

Peter Hoskin, later assisted by Peter House, produced the first 11 News Letters and the first 16 Jabberwocks but then stood down due to their increasing workload with the SOFFAAM travelling sales operation. Edward "Ted" Cuff took over the job, producing News Bulletin No.12 in April 1987and Jabberwock No.17 in July. The two Peters had effected the transformation of Jabberwock into the glossy format it retains to this day. By 1991 Ted handed over the editorial desk to Chris Jessep, who in turn was replaced by an editorial team of SOFFAAM Vice Chairman Maurice Biggs, Secretary Frank Ott and member Steve Farmer. Maurice and Frank continued for several years, bringing in the odd splash of colour for the first time, and moving production to Remous Print of Milborne Port. Throughout its life, a significant element of the magazine's content has been contributions from members and many of these articles have been published between hard covers as "Voices in Flight – the Fleet Air Arm", published in 2013.

Ted Cuff handed over the News Bulletin to David Kinloch around 1990 and he continued as the Editor until the Council decided that the postal charges were becoming too high to support two sets of mail outs, and that it should concentrate purely on Jabberwock. At this stage, Society Secretary Malcolm Smith offered to take over and to combine all the information and other material into a newly-designed magazine. The Council decided at this stage to go for a full colour product and this has been the format to date. As an initiative of Gordon Johnson, who was then the Treasurer, the Society also procured a franking machine and put the process of mail distribution on to a more formal basis. Jabberwock, along with the Society's website, continues to provide information on Society activities to all its members, both at home and overseas.

Our 100th Anniversary edition cover - what will it be for the 200th?

PETER HOSKIN

Just before going to press, we were very sad to hear of the death of Peter, who was a major figure in the early days of Soffaam, holding a number of key roles including Secretary and Jabberwock Editor at various times.

We will include a proper obituary in the next issue of Jabberwock.

Membership

Visit us on Facebook
SOFFAAM

By Simon Websper

A big welcome to the new members who have joined us since the last magazine issue:

3679	Mr S Plympton	Somerset	3682	Ms C Smith	Devon
3680	Mr T Goetz	Wiltshire	3683	Mr D Kimmett	Somerset
3681	Mr S Porrior	Canada	3684	Mr T Martyn	Kent

Total members: 977 **Members who have made a Gift Aid declaration: 696**

Membership Cards

Please note - Standing Order membership cards for August, September and October will be sent out soon, separately, due to the current Covid-19 situation. As the museum is currently closed, this should not cause any issues (please note that receipt of a membership card does not confirm receipt of payment).

If you are an individual member, why not consider upgrading to family membership, to include your beloved, plus your children or grandchildren? It costs only £20 more per annum, to add your wife/partner and up to 3 children. Bargain. Kids love it!!

Payment information

For those very few members still renewing annually by cheque, please note that to keep costs down, we do not send reminders routinely. Please do let us know if you wish to renew by Standing Order instead. If paying/renewing by cheque, please always enclose a stamped, addressed envelope. This saves the Society administration costs.

Remember, we exist to donate to FAA Museum projects only – nothing is spent on salaries.

Jabberwock

Our magazine is free to all members and available as a digital PDF we can send direct to your e-mail. Alternatively, you can receive a printed copy through the post. Please let us know which version you want on the Membership Leaflet.

ANNUAL MEMBERSHIP

The cost has been held at current levels for many years and may increase in the future, so beat any changes by buying now - it makes an excellent gift:

Individual £12

Junior £8

Family (2 adults, up to 3 children) £32

Life £180 (under age 60)

Life £90 (age 60+)

PAYMENT can be made by: Standing Order, BACS/Internet banking, Cheque or PayPal (to soffaam.joinup@gmail.com). Cheques to be made payable to SoFFAAM

Completed forms and cheques to be sent to:

Simon Websper,
Membership Secretary,
22 Kings Yard, Bishops Lydeard,
Taunton, Somerset TA4 3LE.

See inside back cover for a Membership Form which can be used or copied. You can also down load a form from our website.

www.fleetairarmfriends.org.uk

All membership queries to: Simon Websper soffaam.mem@gmail.com Tel: 07527 707204 / 01823 433448

A first hand dim view – Norway 1940

By Telegraphist Air Gunner Dickie Rolph

A Sea Skua of 800 Squadron landing on *HMS Ark Royal*.

Some events have had a fair share of publicity, some have been casually mentioned as of little consequence and some a mere whisper of a mention in passing.

There are those who have said (if a disastrous cock-up was made) that such events are best forgotten. But that view is hardly fair to those who had to carry the can, and certainly not the memories of those who failed to return. Above all it was unfair to those who came after because they were denied the benefits of the lessons learned from those experiences.

Having covered the withdrawal of British, French and Polish troops from Narvik to a little north of Trondheim, the ships carrying them back to England and France were being escorted by units of the Home and other fleets. In the afternoon of 7 June 1940, *HMS Ark Royal* was closing *HMS Glorious* and we were treated to the sight of five Hurricane fighters being landed on *Glorious* by RAF pilots who had not seen a carrier's deck before and did not have the benefit of arrester gear. All made a good landing and we thought that perhaps it would be a starter for a better fleet fighter. We in *Ark Royal* and attendant destroyers parted company to go about our own business of providing wide cover for transports whilst *Glorious* and her destroyers set off for Scapa Flow. The German heavy ships, *Scharnhorst* and *Blucher*, caught up with them early the next morning and sank the lot before any clear alarm signal was transmitted. Later that evening, *Ark Royal* changed course towards the Norwegian coast. The German heavy ships had come to rest in Trondheim and secured close to the town jetty.

An attack on these ships was planned, using 15 Skuas, armed with 250 lb SAP bombs. We were to have the protection of six long range Blenheim 4Fs as fighter cover and six Beauforts of Coastal Command, which would bomb Varnes airfield near Trondheim to keep the numerous German fighters on the deck. The scheme of the attack was that the Beauforts were to attack at 01.58 and our attack was to begin at 02.00, using our usual kind of approach, gliding from 13,000 feet to about 9,000 feet before going into the final dive before dropping the bombs. We had a bit better briefing than before such occasions, but much was still left unanswered, particularly so when we were handed £40 in

Norwegian money - its import was not lost upon us. We were also given better maps and a departure point for return.

All aircraft were ranged and loaded by about midnight. In those latitudes at that time of year it was dusk, but by 01.00 it would be clear daylight again. My aircraft was on the starboard side, right aft, the last one to go and long way to walk with all the bits and pieces one had to carry. My pilot, Petty Officer Monk (later Lt Cdr DSM retired) and I shared the same mess and had some discussions about our antics in the air against German fighters. We had come to the conclusion that since we were much slower it would serve us best if we flew slower still under provocation. You see, even though we were fighter dive bombers, no effort had been made to drill us into any form of air evasion tactics. Air fighting was hardly ever discussed by anybody; it was assumed that you would automatically know all about it. The sky was clear of cloud and we could see for miles as we came in from the sea. At the beginning of our glide I could see the hangars on an airfield some miles from Trondheim well alight and looking up I saw six twin-engined aircraft some 3,000 feet above us. I reported to my pilot that they were the long-range Blenheims. Shortly afterwards these aircraft put their noses down and their twin tails came into view. I changed my report to Messerschmitt 110s, and by this time there were more than six. At this time also all the AA guns in the world seemed to open up upon us, heavy stuff from the ships, batteries along the jetties and main streets of the town, and short range stuff so thick that there wasn't a gap to get through at all. It looked as if a circle of people were standing around throwing up handfuls of lighted stones. The Me 110s were almost shoving each other out of the way to have a go.

As I started firing at the first one, I was sure that I was about to accomplish the air gunner's dream by shooting down an attacking fighter because there were flames coming out of the front of it. I soon realised that the flames were from his cannon and machine guns fitted in the central nacelle and his shells and bullets were going above, below and either side of our aircraft. I thought that his harmonisation was pretty poor but realised that he was inside his normal harmonisation range. He had to alter course violently as my pilot really did his stuff in bringing the Skua almost to a stop. The 110 pulled up very sharply followed by others. Each time PO Monk carried out the same stunt – back throttle, nose turned towards. There was one occasion there was a group of 110s tearing around in a circle just below us, about eight of them, all their rear gunners having a go at just us! I thought this was a bit unfair. I hope that I was faring better than they were. Finally they gave us the benefit of their departure for which we were thankful. By this time we were miles away from the target area without bombs, having got rid of them during the first attack. Heading north up the fiord away from Trondheim we had a discussion and decided to make for the island given us as a departure point. From there we set course for the carrier. On nearing the coast with departure island a long way ahead, we met a group of German twin-engined aircraft which we took for Ju 88s returning from bombing the fleet. It was a case of closing one's eyes, and hoping that you would not be seen. We believe that the Jerries must have done the same for no violence was forthcoming and we passed slightly below them well to one side. On leaving our departure point, the island of Hitra lighthouse, we climbed so that I could quickly get a good signal from the homing beacon, from which we calculated our course to steer back to the *Ark Royal*. This was successfully obtained and PO Monk showed great faith in accepting my new course to steer – a difference of some 60 degrees. After what seemed a very long time we sighted *Ark Royal* dead ahead.

It appeared that much had been going on since our departure some three hours or so before, fog was responsible for a collision, I believe. There were also some attacks by the Luftwaffe. We were not kept waiting long before being allowed to land on. We were the first back and were hustled up to the 'office' to report to the VAA (Vice Admiral Wells). It went something like this:

"Well Monk what happened?'

"Sir, the bloody fool who laid this trip on ought to have his head tested!"

"Now, now, tell me all about it.'

... and Petty Officer Monk did do that. I was hardly spoken to. I offered a drawing I had made of the ships positions in

Sea Skuas of 800 Squadron lined up for take-off from *HMS Ark Royal*, 1940.

Scharnhorst* in Baltic camouflage scheme. © *Bundesarchiv

Trondheim and the torpedo nets, but no one seemed to want that kind of thing. No one seemed interested in the air fighting part of the trip. We were ushered down to the wardroom, and I was offered pot of very flat beer. Now I ask you – flat beer, empty stomach, "shaky do" just completed and all I wanted to do was to tell someone how successful our tactics have been in getting the better of a huge gaggle of German fighters. Not a soul seemed interested!

Five Skuas returned from this attack. Our CO Tim Partridge RM became a POW, his Observer Lt Bostock, (my boss) was killed. A colleague, Petty Officer rating Observer HG Cunningham (later Lt Cdr Cunningham DSM retired) who was navigator of the Red sub flight (pilot Lt Finch Noyes) was shot down by two Me110s carrying out the scissors attack, had the experience of using a smouldering parachute when he had to bail out. He was rescued from the fjord and taken before the German naval captain for interrogation. On being pressed to admit that he came from the *Ark Royal* he had the pleasure of telling the captain that was impossible since the Germans had already sunk it twice. I understand that the captain was far from amused!

It was this attack and the indifference shown that made me specialise in air gunnery when the opportunity came. I was able, when I was the Chief Air Gunnery instructor at the TAG school in Canada, after a struggle, to arrange for fighter evasion exercises to be a part of the air gunnery course, using a Canadian built Hurricane for the purpose. It is perhaps ironical that I and five other Chief Petty Officer air gunnery instructors later spent some months with the RAF and qualified as air gunnery instructors and Gunnery Leaders, in which all the lessons learned were used to the full.

Who can say what such an attack was worth? It was an awfully long time ago.

This first-hand account of Skua operations first appeared in Jabberwock issue 20 in July 1988.

TAG Class 1

TAG Class 2

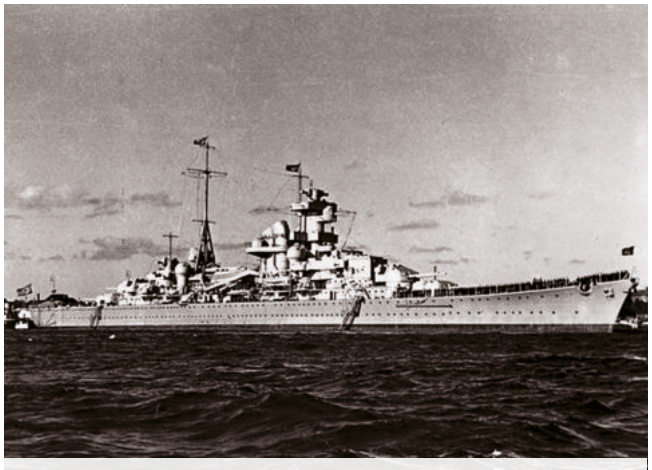
TAG Class 3

Telegraphist Air Gunners

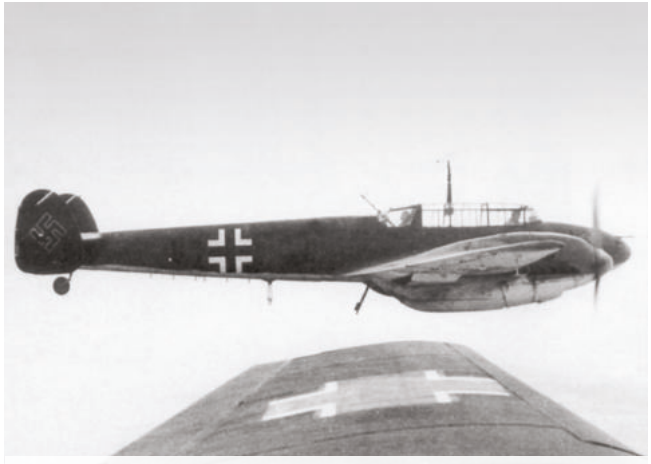
This painting currently hangs in the gallery section at the Fleet Air Arm Museum. It once formed part of a special exhibition celebrating the work of the TAGs during the Second World War.

Telegraphist Air Gunners (TAGs) operated in FAA aircraft from 1922 - 1950, providing communications by Morse code and manning the rear gun. 3,000 TAGs were trained in the Branch's 28 year life span.

495 TAGs were lost through enemy action and/or flying accidents, 69 became Prisoners of War.



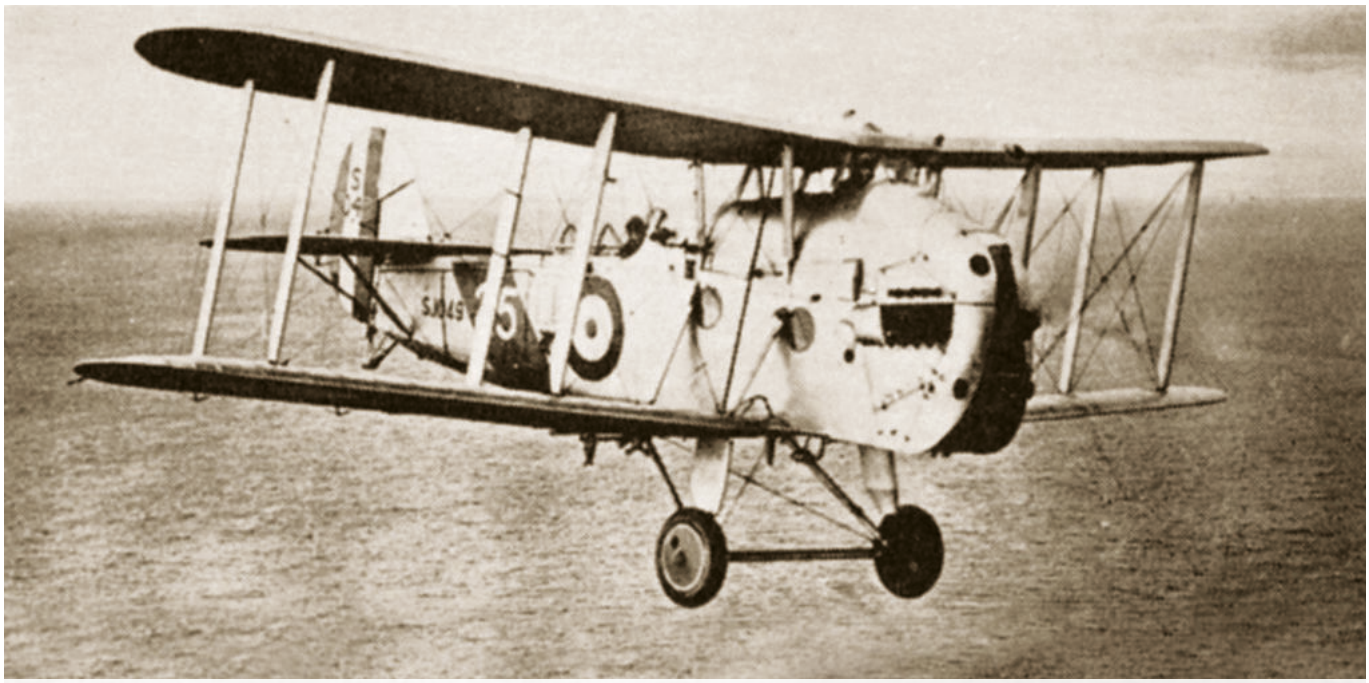
Blucher* circa 1939. © *Bundesarchiv



Messerschmitt Me-110. © *Bundesarchiv*

The Fleet Air Arm's twin ugly ducklings of the 1920s: Bison & Blackburn

By Jim Humberstone



Blackburn Blackburn - developed to meet a naval requirement (Specification 3/21) for a carrier-based reconnaissance and gun spotting aircraft. © *MoD*

Examination of the Royal Navy's attempts to obtain the right aircraft types for their needs in the period between the Fleet Air Arm's loss of autonomy in April 1918 and the 1950s is a well trodden path for historians.

Writings on this subject highlight the way protracted development periods and design culs de sac plagued some procurement and delayed the entry into service of some machines. As an example, in the mid 1940s, British manufacturers such as Fairey, Westland and Blackburn appear to have made heavy weather in the development of their strike aircraft for the Fleet Air Arm, as shown in the troubles that beset the Firebrand, Spearfish and Wyvern during the gestation of their designs.

At an earlier stage however, at the beginning of the 1920s, manufacturers appear to have been more successful in their response to the clear expressions of naval requirements. Experience of the recently concluded conflict meant that reconnaissance over the ocean and spotting for fleet gunnery continued to be key requirements. To satisfy these primary functions in a deck landing form, two designs were produced in response to Specification 3/21 issued by the Air Ministry, namely Blackburn's Blackburn and its contemporary, the Avro Bison. Without doubt these two types possessed a degree of ugliness unsurpassed by any British military aircraft before or since. It could be argued that the need for these planes to accommodate three or even four aircrew did not absolve the respective designers from creating more pleasing lines for their progeny, bearing in mind the way in which, at a later date, the Grumman people with their Avenger managed to meet a similar multi crew brief, with some degree of functional elegance. Even a much derided design of the mid 1940s era, the Fairey Barracuda, appears as fairly rational when compared with the 1920s offerings of Avro and Blackburn.

In both Blackburn and Bison, accommodation was provided for pilot, observer and telegraphist, with scope for a fourth crew member in the deep profiled fuselage of conventional construction. Power was provided by a 450 hp Napier Lion. The Lion was for a while the most powerful aero-engine in existence, its 12 cylinders arranged in three banks of four sharing a common crankcase. Performance in both types was similar, with a maximum speed at 3,000 ft of 122 mph. Both could carry a forward-firing Vickers machine gun and a Lewis gun for self-protection.

The Bison's progress from drawing board to production appears to have been uneventful. First flown in November 1921, a modified prototype undertook trials at AAE Martlesham Heath from early August 1922. It then joined its competitor, the Blackburn Blackburn at Gosport later in the month. The

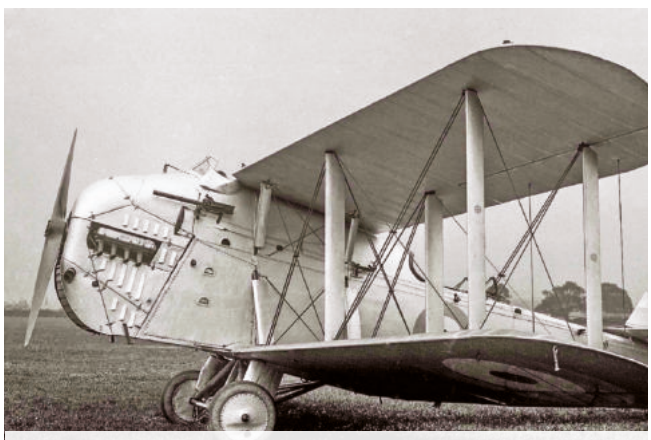
Avro's offering for a carrier-based fleet spotter and reconnaissance aircraft as competition to the Blackburn Blackburn. © *asisbiz*

Blackburn was designed to the same specification, with the manufacturer using the same wing and tail surfaces as in its earlier Dart torpedo bomber.

From Gosport, both aircraft carried out deck landing trials on *HMS Argus*. Both then entered service almost simultaneously in 1923, although the first Bison deliveries were to the Royal Air Force in 1922 to replace the Westland Walrus for coastal reconnaissance work with No. 3 Squadron RAF. A little over 50 Bisons were built, running to two marks. These served in *HMS Hermes*, *Eagle* and *Furious* as well as at shore establishments such as RNAS Gosport. The Blackburn's first operational deployment was with No. 422 Fleet Spotter Flight, which deployed to *HMS Eagle* in the Mediterranean. Both types stayed in service until 1931, being replaced by the Fairey IIIF.

Although the aircraft were accepted for operational deployment, unfavourable comments about their appearance were backed up by more serious concerns about defects in performance. As evidence of this an aiming rod had to be installed in front of the pilot's windscreen on the Bison, to alleviate the poor forward visibility experienced when taking off or deck landing. Difficult access for the pilot to his cockpit, high off the deck, was another problem. This necessitated providing a fixed ladder on the right hand side of the fuselage. Understandably no mention of these difficulties was made in the publicity issued by Avro at the time, the manufacturer describing the Bison's contribution to the Fleet Air Arm as "a conspicuous success ".

Finally, the naval origins of the two types were evidenced by two nautical features, namely the provision of the equivalent of a companion way connecting observer with pilot in the Bison and the insertion of what can only be called "portholes" to improve visibility for the observer in the enclosed cabin of the Blackburn aircraft.



Blackburn R1 Blackburn. © *asisbiz*

Displaying the Sea Fury

SoFFAAM talk – Summarised by Robert Heath

Lt. Cmdr Chris Götke taxis out in Sea Fury T20 VX281 at Duxford Flying Legends in 2014. This is the same aircraft that Chris did a forced landing at Culdrose Air Day a few months later, for which he was awarded the Air Force Cross for his skilled airmanship. © *Richard Macauley*

This is a summary of a talk given by Lieutenant Commander Chris Götke and first published in Jabberwock 74, February 2014.

Many decades ago as a spotty 40 year old, I bought the Royal Naval Historic Flight (RNHF) video tape entitled 'The Sea Fury', featuring pilots John Beattie and Don Sigourney. As a treat, I still slink off to my toy-room and indulge myself with 92 minutes of sheer, drooling delight as I watch it, yet again. It is lovely. And that is how Chris Götke, the current pilot also summed it up in his talk.

Once airborne, from high speed to low speed, you barely need to re-trim, the control harmonisation is so right. The power available is immense and yet it is so smooth. Chris's involvement started as a volunteer pilot for RNHF in 2003. He had joined the RN in 1992 and has since accumulated 3,800 hrs in his log book.

HRH Prince Phillip talking to Chris at The Honourable Company of Air Pilots annual Awards Ceremony where he received The Master's Commendation for outstanding service in the air. © *THCAP*

Like all tail draggers, the Sea Fury can, and will, bite the unwary at any time it chooses on the ground. Power comes from the Bristol Centaurus 18 cylinder, 54 litre, sleeve valve engine, which happily runs at 2,700 rpm. Training commences in the Chipmunk, followed by the T6 Harvard, where in the rear seat you become familiar with not seeing much ahead of you on the ground, then the piston Provost polishes and embellishes all you have learnt so far.

On your first flight in the Sea Fury, you line up, lock the tail wheel and slide the throttle forward - having done so, you are committed, there is nothing you can do to stop it. You have to be very quick on the rudder to correct any slightest deviation. If you are not quick enough, the aircraft takes control and you are a helpless passenger waiting to see what messy event happens next. Closing the throttle makes no difference; the aircraft is in complete control. That knowledge surely concentrates the mind and gets the adrenalin on the move.

In all, 729 Sea Furies were built, many of which were exported. It was developed from the Hawker Tempest and first flew in September 1944. Today the typical cruise speed is around 240kts and higher speeds are at around 330kts in level flight. Stall is around 80kts. It carries up to 183 gallons of avgas, which will comfortably take you to Liverpool, do a

Lt. Cmdr Chris Götke displays the Sea Fury T20 VX281 at Duxford Flying Legends 2014. © *Richard Macauley*

display up to +4G limits and then return you to Yeovilton.

That was the theory out of the way. Chris then delighted us all with not just one, but several films showing typical display routines seen from over the pilot's shoulder. So smooth, so realistic that some people had to look away from the screen. It is not only the sight, but also the tingling, whistling sound. Lovely. Behind all this is the enormous effort and logistics to keep the Sea Fury, Sea Hawk and two Swordfish airworthy. The costs are enormous and most parts are close to impossible to source. A recent Pegasus rebuild cost £50k alone. Any deviation from original material specifications or methods incur prohibitive bureaucracy and costs. Cosworth has replicated pistons and modern telemetry enables engines to be monitored very finely. It is an expensive business and RNHF is grateful for every bit of support it can get. You too can make your contribution - see the website.

I have left out so much detail. It was a great evening enjoyed by yet another full-house.

Lt. Cmdr Chris Götke receives his AFC. © *MoD*

Air Force Cross Presented by Prince Charles

Lieutenant Commander Chris Götke RN, Commanding Officer of the Royal Navy Historic Flight was presented with the Air Force Cross by His Royal Highness The Prince of Wales at Buckingham Palace on 12 June 2015.

Chris, who was awarded the AFC for heroically landing Sea Fury T20 G-RNHF VX281 after suffering engine failure at RNAS Culdrose Air Day in July 2014, faced the deeply unenviable choice of jumping out of the aircraft or crash landing in a field. Despite rapidly losing altitude, Chris bravely chose to stay with the aircraft, pulling the plane out of a steep dive and managing to glide the heavy fighter back over the airfield boundary.

His citation praised his 'extraordinary and instinctive flying skills which averted disaster and prevented the real chance of catastrophic loss of life.' He minimised damage to a historically important aircraft and his 'quick thinking and exemplary airmanship was one of the finest examples of gallantry in the air in peacetime.'

Captain Winkle Brown

SoFFAAM talk – Summarised by Malcolm Smith

Me-262V7, WNr-130303 Germany 1945. © *Bundesarchiv*

For more than 90 minutes, a frail, elderly man held an audience of more than 100 in the palm of his hand. This was Captain Eric 'Winkle' Brown, CBE DSC AFC RN, addressing an audience of Royal Naval Reserve officers and SOFFAAM members on the afternoon of 12 March 2015 in the FAAM's Swordfish Centre.

In the morning, SOFFAAM members had witnessed the unveiling of a bronze bust of Captain Brown by Kirsty Young, the BBC broadcaster who had been fascinated by the 93 year old aviator when he was the castaway on the 3000th edition of "Desert Island Discs in November 2014.

Sculptress Jenna Gearing, Captain 'Winkle' Brown and Kirsty Young.

An upright figure at the lectern, referring only occasionally to his notes, Eric Brown took us back to the end of the Second World War when he was serving at the Royal Aircraft Establishment. A fluent German-speaker and already renowned as an exceptional test pilot, he was selected to travel to Germany to investigate the technology of all things aeronautical in the conquered country. The Germans were known to have developed highly-advanced weapons, including ballistic missiles and various turbo-jet and rocket powered aircraft. Did we know, he asked the audience, that Wernher von Braun, the celebrated German aerodynamicist, had established a Mach 4 wind tunnel in 1939? No, we did not, it seemed. Wind tunnels were not the only objects of Eric's quest; there were many high-technology aircraft for him to examine and, given his outstanding piloting skills, actually to fly. The most advanced of these was the tail-less rocket-powered Messerschmitt 163. Although not allowed to ignite its powerful rocket motor in flight, Eric conducted several gliding test flights after having been towed to altitude by a Spitfire.

Eric illustrated probably the most advanced German fighter to go into service in any numbers, the Me 262. He described the Jumo turbo-jet engines, slimmer and more streamlined than their contemporary British jet engines because of their axial-flow compressor design. This aircraft carried four 30 mm cannon, capable of seriously disabling their main target

– the American B17 bombers then pulverising German cities. A drawback of the aircraft in the fighter role, said Eric, was its lack of an airbrake, so that their pilots were constrained to use their superior airspeed in single "slashing" attacks on their targets. The Me 262 was also operationally limited in that the lack of metal alloys capable of withstanding the very high operating temperatures of their turbines meant that the operational life of their engines was only about five hours. The engines designed by Sir Frank Whittle in the UK, with their robust centrifugal compressors, had a much longer usable life.

Eric's skills in colloquial German meant that he was several times called upon (and once or twice inveigled himself into the opportunity) to interrogate German prisoners. These included the male and female Commandants of the Bergen-Belsen concentration camp. The female Commandant, said Eric, was the most evil woman he had ever met. She would not answer any questions; only responding with a Nazi salute. He also questioned Himmler and asked him why so many SS soldiers were concentrated in the underground factories where the V2 rockets were being assembled. Himmler replied that the rockets were built by foreign workers (in fact slave labourers, who were worked to death in appalling conditions). These workers sometimes sabotaged the components of the rockets, said Himmler, so the guards were there to "provide quality control".

Another infamous interviewee was Herman Goering. His American captors had decreed that he was always to be addressed as Herr Goering, but Eric paid him the courtesy of calling him by his rank of Reichsmarschall and making it plain that he (Eric) was an aviator just as was Goering. He was only allowed to ask a few questions, one of which was: who did the Reichmarschall think won the Battle of Britain? It was a draw, replied Goering, basing his reply on the fact that by the time the Battle ended, the RAF was losing more aircraft and aircrew than the Luftwaffe. Captain Brown described several other advanced German aircraft, including the twin engined Arado light bomber and the unique Pfeil (Arrow) which had an engine and propeller at both ends. Both of these aircraft, he said, were fitted with ejection seats.

Enlivened by the occasional witty aside, this fascinating tale was told by an extraordinary man. We in the audience could have wished for it to continue; but all good things must come to an end. Captain Eric Brown has lived through (and taken a full part in) dramatic and historic events. We were all extremely fortunate that he is still here to tell us about them.

The Hinterbrühl/Mödling He 162A underground production line. © *Bundesarchiv*

Messerschmitt Me 163 Komet. © *Bundesarchiv*

Dornier Do 335 Pfiel. © *Bundesarchiv*

Arado Ar 234 V9. © *Bundesarchiv*

Post war, given his excellent aviation knowledge and ability to speak German, he was tasked with interviewing many leading characters in the German aviation industry including Willy Messerschmitt (they did not get along – "We had a bit of a to-do" about compromises in the quality of his aircraft), Dr. Ernst Heinkel, Luftwaffe commander Hermann Goering (when Eric asked him about the outcome of the Battle of Britain Goering stated "A draw"), Wernher von Braun (responsible for the development of the German V2 rocket and later helped man reach the moon) and the famous female test pilot Hanna Reitsch.

Eric Brown test flew captured Luftwaffe aircraft like this Heinkel He-177 Grief bomber, with RAF markings applied, post WW2.

‘Down in the Drink’

SoFFAAM talk – Summarised by Robert Heath

Bill (second from left) with the Captain of the rescue vessel *USS St George*. © *Bill Reeks*

I think an alternative title could have been: “The intrepid adventures of ‘Avenger’ Bill”. If you were not there, you missed a very engaging and profusely illustrated talk by our long-time SOFFAAM stalwart - Our man in the Pacific, literally.

Bill was a FAA observer from 1942 to 1946 (one of my numerate colleagues immediately calculated that that makes Bill aged about 92!). This particular sequence started on a cold day in December 1944. Bill had been given a rail warrant to Glasgow and set off with all his heavy winter gear, plus of course the bulky navigator’s kit. En-route he met an old colleague, Lt Cdr Bobby Bradshaw, carrying just a small, light suitcase. Conversation revealed that they were on the same posting and Bobby was better informed. He knew that winter kit was unnecessary in the tropics and his suitcase mostly contained liquid refreshment.

By mid-January 1945, the transport ship had deposited them in Ceylon to join a ‘pool’ squadron on a jungle airstrip. They were there to replenish passing aircraft carriers in need of aircraft and crews and in February, Bill was called to join 848 Squadron on *HMS Formidable*. The squadron comprised, unusually, 18 Avengers and 18 Corsairs and they were part of the British Pacific Fleet on its way to Sydney, for leave. Luck? In transit, all the aircraft had their familiar red, white and blue roundels altered to blue with a white centre, to avoid any risk of being mistaken for the red Japanese roundel. In April 1945, the American forces went to battle in Okinawa and the British Pacific Fleet was tasked with keeping Japanese aircraft out of the way. In Bill’s case, this meant bombing the Japanese airfields in the Sakashima Gunto. The runways in these islands were made of crushed coral, so they were very easily and quickly repaired. This meant that bombing was a repetitive task. On 16 April the first operation was at dawn, which caught the Japanese by surprise and everyone was comfortably back on-board for a late breakfast. 17 April was much the same.

On 20 April the planners chose to launch the bombing raid at midday. The Japanese were not caught by surprise and the flak was very heavy, causing Bill’s pilot to report that the engine had lost power. Not good news at a time when the Japanese had a reputation (later confirmed) for executing captured aircrew. Fortunately the pilot was able to glide the aircraft several miles out to sea, during which, Bill sent out repeated Mayday messages. The water landing was a good one which, to Bill, felt hardly different from a deck landing. All three crew stepped out and would have remained dry but for the fact that the dinghy emerged upside down and had to be righted from the water. Quite soon a searching RN Firefly appeared overhead, but Bill’s signal flare failed to work and the aircraft disappeared over the horizon. Meanwhile, as they learned later, *HMS Formidable* retired from the area for necessary refuelling and replenishment. Not to worry. Bill and team were confident. They had a plan. The dinghy was drifting at a rate of 1 or 2 knots, therefore they reckoned that they would reach Formosa within four or five days. Formosa, although in Japanese hands, had a Chinese population who were friendly to the allies.

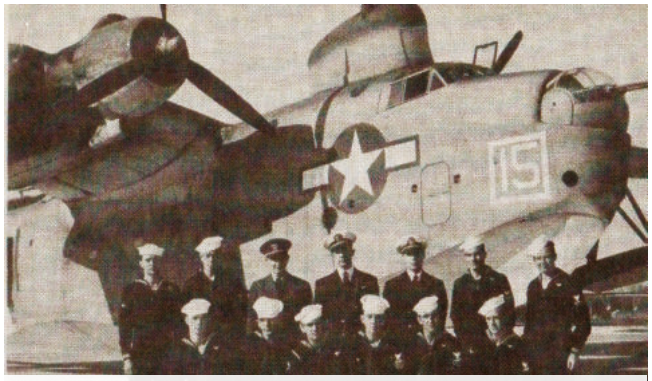
27 hours later, including two wet and cold nights, and after

Bill nearly sank the dinghy by wearing a hole in the fabric, two Avengers were seen re-forming overhead. They had been sent on a search for downed aircrew from the Escort Carrier, *USS Santee*. This time the flare worked and was spotted. Shortly after, a US Navy Martin Mariner seaplane landed and picked them up. After requesting Bill to donate his Mae West (as being much better quality than the US version) the aircrewman cautioned them to cover their ears. The rocket-assisted take-off was incredible for both the ear-splitting noise and unbelievably fast lift-off. Two hours later they landed and were transferred to *USS St. George*, a tender that was specifically equipped to receive and rehabilitate rescued aircrew. Frustratingly, Bill learned that the original search continued in the area where they had ditched and took no account of the fact that they had drifted 40 miles in the meantime. That mentality is worrying.

In due course the three of them hitched numerous lifts by air to Leyte to rejoin *HMS Formidable*. One leg of this trip was in the luxury of a DC4, still in peacetime airline configuration.

Many years later in 1998, a member of the US rescue ship's crew tracked-down Bill at home and invited him and Guy "General" Gordon, the air gunner, to a reunion of the USS *Santee* in Colorado Springs. While there Bill was delighted to be given a copy of cuttings from numerous publications featuring their rescue, plus a copy of the Martin Mariner pilot's log book entry. He now possesses a comprehensive archive on the whole episode. Asked: 'Were they ever worried?' The answer was a confident: 'No, we had a plan!'

This is a summary of the talk given by (then) SOFFAAM member, Bill Reeks, in October 2014 and published in Jabberwock 78.



Crew of the rescue Martin Mariner aircraft. © *Bill Reeks*

Bill and his wife in Colorado 1998 at the reunion. © *Bill Reeks*

Photo Quiz

Compiled by Gil Johnston

All the photos depicted here were taken in the Fleet Air Arm Museum by Gil. No prizes for guessing which aircraft are shown here but good luck with your aircraft identification skills. The answers can be found on page 48.

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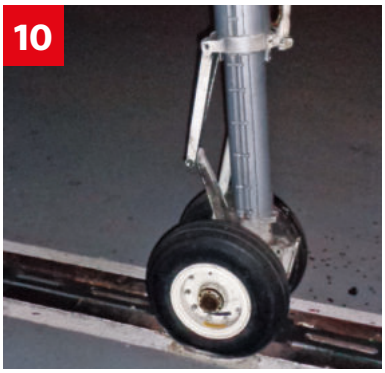

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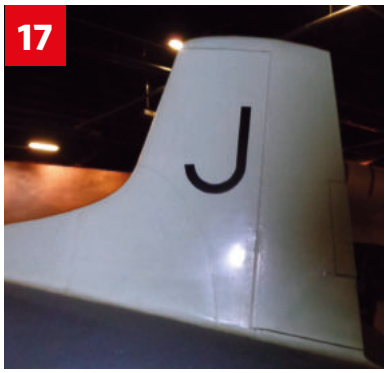

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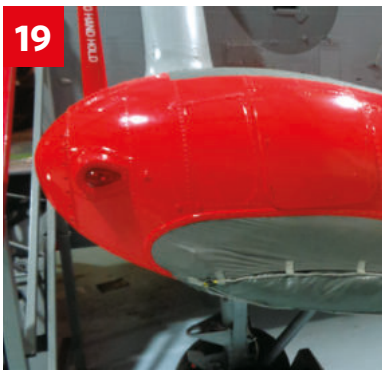

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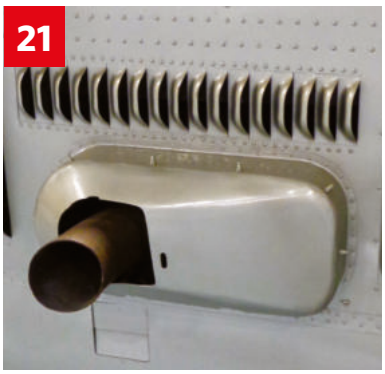


Future Talks Programme

By Richard Macauley

As we go to press with this anniversary edition of Jabberwock, the Coronavirus pandemic is beginning to ease its grip on the world.

However, the enforced suspension of all public gatherings meant that we had no choice but to cancel our monthly talks programme back in March 2020. A huge blow to the membership and also the speakers who enjoy delivering their stories as much as we like to hear them.

The good news is that so far, our cancelled speakers have been understanding and all have re-booked for 2021. Therefore the 2021 Talks programme is already underway, along with potential new speakers also being identified.

As from the March Talk cancellation, as I am the person responsible for arranging speakers, I have taken the following approach in contacting each speaker a month ahead of their appointed date and cancelled their talk. We will continue in this vein for the foreseeable future while the Fleet Air Arm Museum is closed, as for practical reasons, we cannot hold our talks in any other location.

As the year continues and FAAM eventually re-opens, we can recommence our talk nights subject to regular reviews of Government guidelines for gatherings and meetings. To this end, below is a listing of the speakers we still have booked for 2020 and those who have rebooked for 2021. However do please remember that this is provisional and talks could still be cancelled as we continually review the latest guidance on holding such meetings.

You can check the status of future talks by visiting the SoFFAAM website www.fleetairarmfriends.org.uk

We will also comment on Facebook #SoFFAAM about the re-instatement of talks.

So please hold the faith while we await the pandemic to subside and we can all meet again to hear illuminating stories and anecdotes from inspirational speakers.

Thursday 24 September 2020

Lt. Col. Allinson

Joint Air Delivery Test and Evaluation Unit RAF Brize Norton

JADTEU conducts operational trials and evaluation of delivery by air of personnel, machines and materiel for the military.

Thursday 29 October 2020

Lt. Cdr. Alexandra Brooks RN - TBC

A full time reserve officer with postings to Permanent Joint Headquarters, Northwood, Bahrain and Afghanistan.

Thursday 26 November 2020

Stephen Pitts

Stephen will talk about his father, James Pitts, a young TAG during WWII and whose Russian Convoy was involved in the last sea battle of the war.

Thursday 28 January 2021

The RAF Presentation Team

The RAF Presentation Team delivers an exciting and informative talk about the modern Royal Air Force from serving RAF personnel.

Thursday 25 February 2021

Gp. Capt (Retd). Jock Heron

After TSR2, the Birth of Tornado

A very informed speaker to speak on these fine aircraft - one that never was and the other that retired after a very illustrious career.

Thursday 25 March 2021

Sgt. Mark Service

Life and times of RAF life

An entertaining speaker with anecdotes on his life in the RAF including being part of the Joint Helicopter Support Unit at Lockerbie immediately after Pan Am 103's fatal crash. Mark will also talk about his tour in North America as part of the C-17 Crew supporting the Red Arrows.

Thursday 29 April 2021

Sqn. Ldr (Retd). Rod Dean

The Wooden Wonder – Development of the de Havilland Mosquito

Another welcome return for Rod Dean and his talk this evening is an in-depth study of the development and use of the outstanding de Havilland Mosquito and all its variants.

Thursday 27 May 2021

Col. Richard Graham, USAF (Retd.)

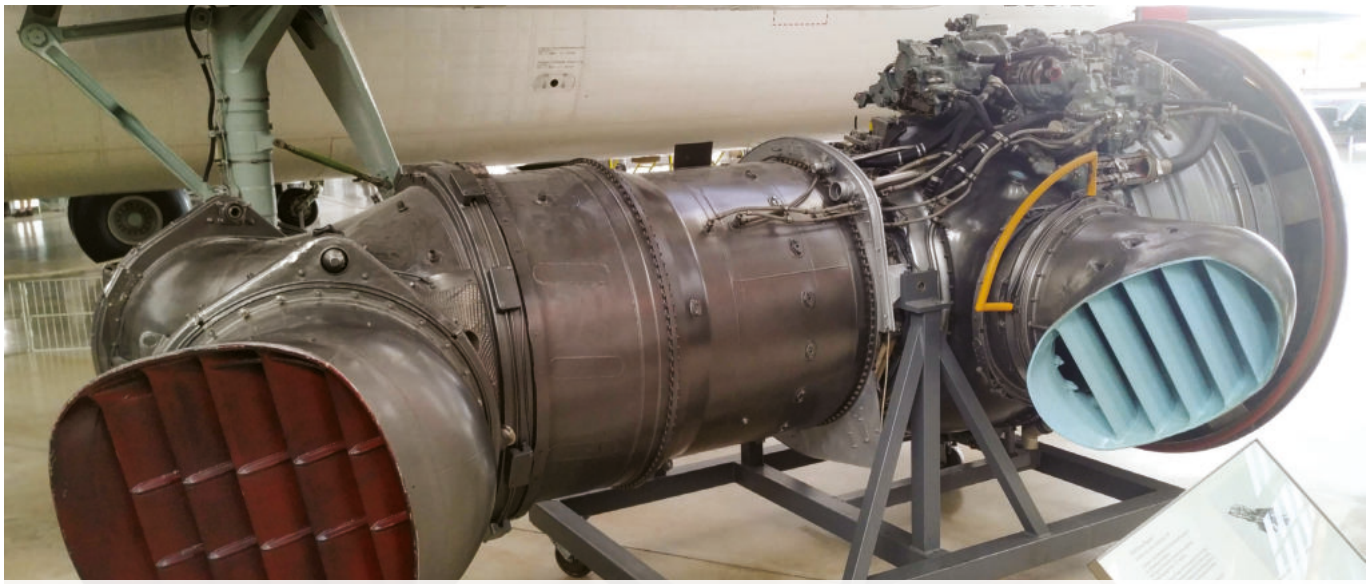
Flying the SR-71 Blackbird and its operations

Colonel Graham graduated from Air Force pilot training in 1965. After Instructor Pilot and Flight Examiner duties, he transitioned to the F4 and flew 210 combat missions over North Vietnam and Laos.

In 1974, he was selected to enter the SR-71 program at Beale AFB and after seven years, piloting the fastest and highest-flying jet aircraft, he was selected to be the SR-71 squadron commander and went on to be the 9th Strategic Reconnaissance Wing Commander.

The Bristol Pegasus Engine

By Malcolm Smith



A good view of the complete engine, clearly showing the layout of the nozzles.

In "The origins of the Harrier", published in Jabberwock 99, the author, Jim Humberstone, described how the Bristol Aeroplane Company developed the Orpheus lightweight engine, initially to power the Folland Gnat and subsequently, with funding from NATO's Mutual Weapons Development Programme (MDWP) to propel the NATO lightweight fighter, the G91. The G91 was built in large numbers and operated by several air forces, including those of Italy, Germany and Portugal. The success of its well-developed, reliable engine owed much to its robust and simple design.

In his book "Not Much of an Engineer", Stanley Hooker (the chief designer of the Orpheus and subsequently Pegasus) relates that he aimed to produce a turbojet weighing only 800 lb but producing 5,000 lb thrust. Previous axial-flow engines had all been designed with three main shaft bearings, one at each end of the compressor stages and a third to support the turbine. With a relatively short seven-stage compressor, Hooker settled on only two bearings, one at each end of the shaft. To avoid "shaft whirling" (the tendency of long rotating thin tubes to bow outwards and fail) the main shaft was made as a thin-walled tube about eight inches in diameter. This proved to be a providential design feature in future developments. The simplicity of the design meant that the development process was extraordinarily quick, with the first engine running in early 1955 and the first production model appearing in May 1957.

1957 was also the year in which serious attention was being paid to Vertical Take-Off and Landing (VTOL) technology. The emerging technology demonstrator aircraft, such as the Rolls Royce "Flying Bedstead" and the Short SC1, with two or more engines providing vertical lift, seemed to Hooker to embody unpredictable flight control risk should one of these engines fail. The French aeronautical designer, Michel Wibault, had proposed a more elegant solution, in which a single engine (he had identified the Bristol Orion) provided both lift and thrust. He proposed four large engine-driven centrifugal compressors, arranged like wheels on the sides of a small airframe that he christened Le Gyroptere. The compressors ran inside circular casings, which could be rotated from horizontal to vertical to provide forward thrust or vertical lift as required. This concept became known as "vectored thrust". Hooker thought the design both practical and realistic, but it required a complex (and heavy) system of shafts and gearboxes to drive the four compressors. Gordon Lewis, one of Hooker's design team, suggested one large axial compressor to replace the centrifugals with two rotating nozzles, one each side. Hooker concluded that, for a fighter-type aircraft, it would be better to replace the complex and expensive Orion with the cheap, lightweight Orpheus, while the obvious place for the extra compressor would be at the front. He determined to make it an integral part of the engine, with its inner portion boosting the efficiency and power of the original Orpheus compressor. The air from the outer part of the compressor could be ducted to left and right vectoring nozzles, while the central hot gas stream could also be used for lift.

The definitive design of the BS53 (as the Pegasus was originally identified) began in 1958. As with the Orpheus,

MWDP funding paid for 75% of the cost, with the rest made up by private venture (PV) funding. The additional compressor stages and the turbine that powered them were mounted on a separate coaxial shaft inside the (conveniently large-diameter) Orpheus high pressure shaft, meaning that each could run at its most effective speed. In a neat design innovation, Hooker arranged the two shafts to rotate in opposite directions, thus considerably limiting the potential gyroscopic forces that would have given serious control problems when the aircraft came to the hover. Sydney Camm (who was producing a typical Hawker airframe to accommodate the Pegasus, again with PV funding) remembered his bifurcated jet pipe on the Sea Hawk and suggested a similar arrangement for the Pegasus, connected to a second pair of nozzles rotating in unison with the first pair. The front jets delivered air at the relatively low temperature of 100 deg C, while the "hot" jets provided a gas stream at 650 deg C, but the Pegasus was designed so that each pair of jets gave approximately the same thrust, again contributing to the stability and controllability of the aircraft. It was essential that the four nozzles rotated in unison in the transition between vertical and conventional flight modes, so the team's design solution used compressed air from the low pressure (LP) compressor to power two air motors feeding into a differential box. This was designed so that, if one motor were to fail, the other would continue to drive at half speed. Cross shafts from the box drove motor-cycle chains passing round the two pairs of nozzles. This arrangement has proved to be almost entirely reliable throughout the life of the Harrier.

As with the Orpheus, the design process was extraordinarily quick and the first development engine ran in August 1959. This produced only 11,000 lb of thrust, which was lower than expected. However, it would be sufficient to get daylight under the wheels of a stripped out P1127, so in September 1960, Hawker's Chief Test Pilot Bill Bedford lifted off in the prototype aircraft from a special grid at Dunsfold. Within a year, development had proceeded at such a pace that Bedford was able to make the first accelerating transition from a VTO to high speed horizontal flight.

Notwithstanding these impressive developments, the Royal Air Force had shown little interest in VSTOL; but the loss of its strategic nuclear deterrence role brought about by the adoption of Polaris increased its focus on ground attack and reconnaissance. The UK Government part-funded the development of the P1127 into a more-capable aircraft, named the Kestrel. For this application, Bristol increased the thrust of the engine to 15,000 lb. The Kestrel proved to be a successful precursor to a genuine tactical fighter/ground attack aircraft. During 1966, following the cancellation of the supersonic P.1154, the RAF ordered a modified derivative of the P.1127/ Kestrel, designated the Harrier GR1. By increasing the mass air flow through the engine and increasing the operating temperature from 970 deg C to 1,170 by using air-cooled cast blades in the turbine, thrust was increased firstly to 18,000 lb and later to 21,000 lb, enabling the aircraft to carry a significant load of sensors and weapons. The US Marine Corps also ordered 100 aircraft in 1969. Consequent Harrier development is beyond the scope of this article, but variants of the aircraft, and its unique engine, have performed effectively in all sorts of land and maritime environments for a variety of operators.

The story of the Pegasus is one of inspired technical innovation, in which the Chief Designer, himself a brilliant mathematician, led a dedicated design team to produce a solution for which no coherent military specification had been formulated. Very little of this activity would have been possible without financial support, partly from NATO but also by the willingness of the Bristol Board of Directors and especially Hooker's friend Reginald (later Sir Reginald) Verdon-Smith to fund development activity for a long period when it was not certain that the Pegasus would ever sell. It is difficult to imagine a success story of this magnitude in today's defence procurement climate.

A sectioned example of the Pegasus (now the Rolls Royce Pegasus after industry amalgamation). Components from left to right include the wide diameter LP compressor. A mounting ring indicating the location of the forward nozzles, the HP compressor, the LP shaft, the two turbine stages and the bifurcated jet pipes connecting to the rear nozzles. Ducting and combustion chambers have all been removed. Photograph by Jaypee.

Hawker P1127 first tethered flight 1960. © *Crown copyright*

Harrier GR1 of 1 Squadron RAF during sea trials with *HMS Ark Royal*. © *Crown copyright*

Sir Stanley Hooker

By Malcolm Smith

Much of the content of the preceding article is drawn from the autobiography of Sir Stanley Hooker, the designer of the Pegasus (and several other engines).

A brilliant mathematician, in 1935 he was awarded a DPhil from Brasenose College Oxford, where he had become interested in supersonic airflows. His thesis on the subject included a proposal to design a wind-tunnel capable of studying airflows at speeds up to 1,000 mph, an unheard-of specification in 1935. His first job was as a Scientific Officer in the Admiralty Laboratories at Teddington, but he was soon invited to an interview with Colonel Barrington, who was Chief Designer, Aero Engines, at Rolls Royce at Derby. At the interview, Barrington talked vaguely about the need to stress more accurately the components of an engine. This conversation depressed Hooker somewhat, as it seemed rather a long way from his own areas of interest and qualifications. He thought the interview somewhat unsatisfactory and returned to the Admiralty Laboratory, thinking nothing of it. Two months later "like a bolt from the blue" he received an invitation from the Derby Works Manager of Rolls Royce, Ernest W (later Lord) Hives asking him to attend another interview. Hives, as Hooker remarks, inspired and directed the enormous contribution to the war effort that Rolls Royce were to make under his leadership.

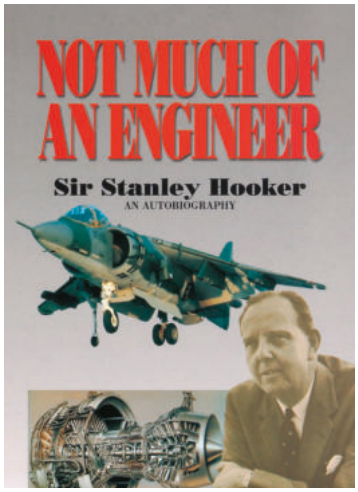
In Hives' office, Hooker saw that the great man had several copies of his publications on his desk. After a few questions about Hooker's knowledge of aerodynamic theory, which he answered as best as he could, Hives leaned forward and said "You're not much of an engineer, are you?"

Hooker had to agree, and Hives said "Never mind, this place is full of the best engineers in the world, I hear you are a mathematician of ability." After a further short conversation, he said abruptly "When can you start?"

Once he had found his feet at Rolls Royce, Hooker turned his attention to a subject that exactly matched his expertise, namely the mass airflow through the Merlin supercharger. By improving both the design of the supercharger impeller and the air intake that fed it, he hugely improved the performance of the Merlin; increasing the full-throttle altitude from 16,000 ft to over 19,000 ft, giving a crucial margin over contemporary German fighters. He continued to be involved in improving the performance of the Merlin for four years and looked back on this as the most satisfying and important years of his life: "the first steps down the road of becoming an engineer".

His was a most illustrious career, including assisting in the productionsiation of the Whittle jet engine, and designing Rolls Royce's first axial flow engine, the Avon. He eventually fell out with Hives and moved to Bristol, where (as described elsewhere) he was responsible for the design of the Orpheus and Pegasus. Finally, he helped to rescue Rolls Royce when the delays to their vital RB211 engine drove the company into near bankruptcy.

The last words belong to him, in discussing the role of design engineers: "The word "engineer" covers a variety of expertise ... the crème de la crème of these are the designers, and if it be true that the status of engineers is low in Britain, then the charge applies first and foremost to designers."

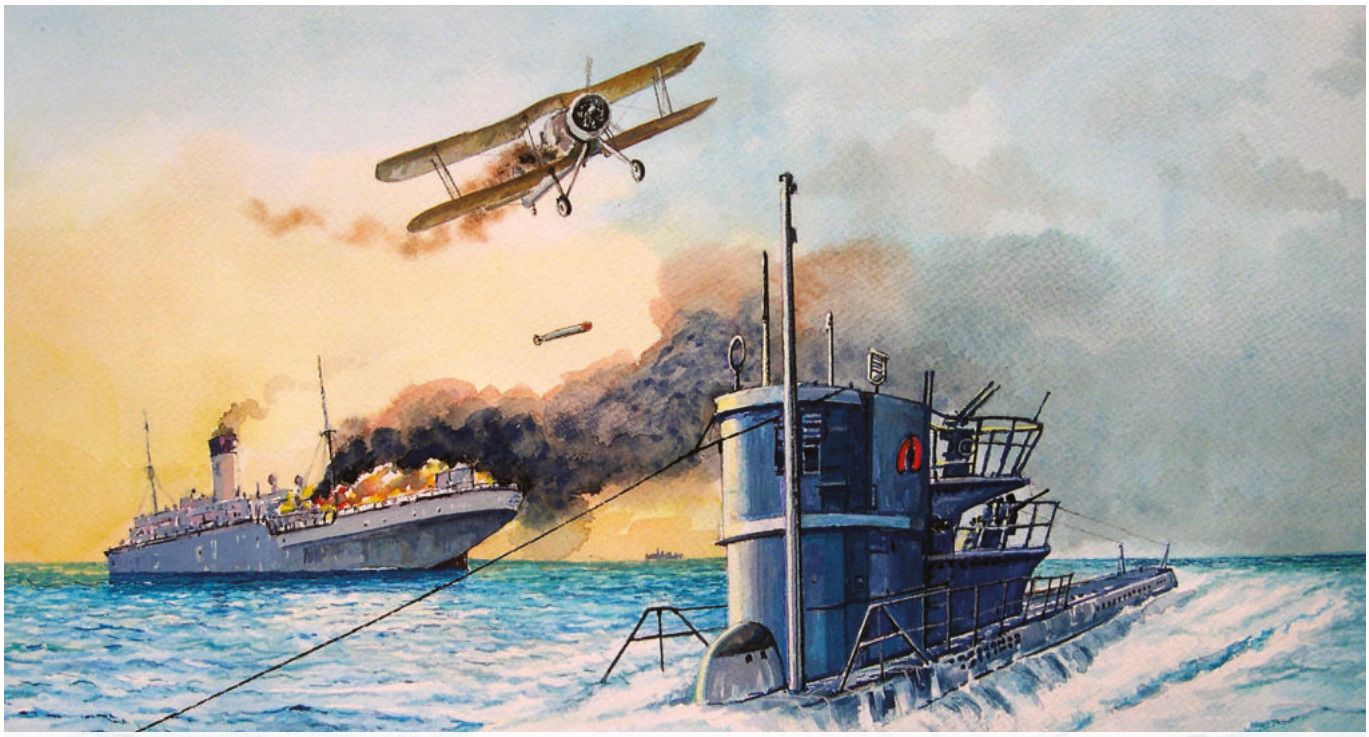


The cover of the Autobiography of Sir Stanley Hooker.

Sir Stanley Hooker with his good friend, Sir Frank Wittle. © *Stephen Greenstead*

The Fleet Air Arm's Fairey Swordfish and the German U-Boat

By Jim Humberstone



"Battle of the Atlantic (Part 3)" by artist Michel Guyot courtesy of www.SubArt.net. *Copyright by artist 2020. All rights reserved.*

The Battle of the Atlantic was against one of the most dangerous threats posed to the British Isles in World War II: the severing of our sea lifelines by German submarines.

Who could have predicted at the outbreak of the war that one of the U-Boats' most dangerous, sometimes lethal, adversaries would prove to be a large lumbering Fleet Air Arm biplane, first flown in the early 1930s; a machine that was not only largely fabric covered but still providing open cockpits for its three aircrew? This extraordinary aircraft, the Swordfish, confounded sceptics as the war progressed. It accommodated in its stride state of the art ASV radar and helped the allies to pioneer that most devastating of anti-U-Boat weapons, the rocket projectile. The combination of these with an under wing (so-called Pumpkin) version of the famous RAF-developed Leigh Light effectively placed the Mark III Swordfish as a sub-hunting weapon almost equal to its contemporaries, the more modern twin-engined RAF Coastal Command aircraft such as the Hudson and Wellington. In spite of its slow performance and cruel crew conditions, it saw off later Fleet Air Arm additions such as the Albacore and Avenger which were unable quite to match its night performance. In the face of its apparent imperfections, the reputation of the Swordfish actually climaxed in early 1945, for in the closing months of the war it achieved the most impressive accolade of all: the formation by the RAF in January of that year of two new squadrons of Mark III machines. These were specifically tasked to undertake night patrols in the Channel in the hunt for German Seehund and Biber midget submarines.

The introduction of small escort aircraft carriers in the convoy escort role, from 1942 onwards, proved to be a highly effective antidote to U-Boat attacks. Swordfish played a critical role in this task, complemented by ship borne fighters such as the Grumman F4F Wildcat (known initially as the Martlet in the RN), the Seafire and Sea Hurricane. These in some instances co-operated in attacks by making strafing passes. While most Fleet Air Arm U-Boat attacks were from carriers, some successes were achieved by aircraft flying from land bases such as Gibraltar and Aden.

As the availability of escort vessels improved, encounters with U Boats increasingly involved Swordfish co-operating with dedicated Escort Groups such as the 2nd, commanded by the legendary Captain Walker RN. These were tasked to act autonomously to hunt down U-Boat packs away from the immediate vicinity of merchantmen in convoy. The presence of these units gave even more scope for escort carrier based Swordfish to participate in successful attacks, such as those

which turned the tide in the Battle of the Atlantic in May 1943.

Wartime convoys had fundamental importance for the prosecution of the war. They operated along three principal routes, the North Atlantic, the Arctic and the so-called Gibraltar Run. Convoy protection by carrier aircraft such as the Swordfish was complemented by land based RAF Coastal Command patrols. On the outbreak of war, this Command had in part relied upon some quite inadequate aircraft such as the Avro Anson. Later, flying from escort carriers, Swordfish crews could find themselves co-operating with far more effective units such as Very Long Range Liberators, with the U-Boat campaign aided by bases established in Iceland and the Azores which served to reduce the so-called Ocean Gaps for the land based aircraft.

The first U-Boat sank by a Swordfish in WWII might be described as a target of opportunity. A small number of Swordfish, equipped with floats, served aboard larger RN warships for reconnaissance duties during the early stages of WWII. Catapulted from *HMS Warspite* during the Norway Campaign, one such aircraft of 700 Squadron attacked and sank U64 with depth charges in Herjangs Fjord, Narvik on 13 April 1940. It had come across the U-Boat while scouting ahead to report fall of shot during the battleship's incursion up the fjord. It would be over a year before a Swordfish obtained another U-Boat sinking. This occurred during the voyage of convoy HG76, homeward bound from Gibraltar in late 1941. On this occasion, in addition to the cover provided by the addition of the newly commissioned Escort Carrier *HMS Audacity*, patrols were carried out from Gibraltar by Swordfish of 812 Squadron whilst the convoy was within range. On 21 December 1941, during one of these sorties, U451 was successfully depth charged and sunk off the coast of Tangier.

With the advent of the escort carrier as a regular convoy guardian, the Swordfish came into its own as a sub-hunter. With Luftwaffe and U-Boat attacks focusing increasingly on the Arctic convoys, it is not surprising the next sinking should take place along that route, on 14 September 1941, with credit for the sinking of U589 off Spitzbergen shared jointly by an 825 Squadron aircraft flying from the escort carrier *HMS Avenger*, with the RN destroyer *HMS Onslow*.

In early 1943 another joint sinking occurred on 25 April, Flying from *HMS Biter* (one of the US-supplied escort carriers) an 811 Squadron Swordfish assisted the destroyer *HMS Pathfinder* in the destruction of U203 south of Greenland. This was followed up just under three weeks later on 12 May when, in another co-operation between aircraft and surface ships *HMS Lagan* and *HMS Broadway*, an 811 Squadron Swordfish from *HMS Biter* sank U89 off Cape Finisterre while escorting convoy HX237. Swordfish scored again less than a fortnight later; this time an aircraft from 819 Squadron flying from *HMS Archer* sank U752 off Narvik on 23 May by rocket attack,

Whether singly or in co-operation with surface escorts, Swordfish were proving their worth. The late spring of 1943 was the period after the pendulum of success in the Battle of the Atlantic had swung decisively in the Allies' favour, with over 30 U-Boat sinkings in one month alone. 1944 became the year of destiny in the Battle of the Atlantic, with 16 U-Boat sinkings by Swordfish, either singly or in co-operation with surface escorts. In February an 842 Squadron aircraft, from *HMS Fencer* sank U666 by depth charging west of Ireland. The first week of March saw *HMS Chaser* score a kill when on the 4th, one of its 816 Squadron aircraft sank U472 in the Barents Sea, this time by rocket attack, having been assisted by the destroyer *HMS Onslaught*.

The following day, the 5th, an aircraft from the same squadron sank another U Boat. This time U366 was dispatched by rocket attack. The hat trick was achieved on 6 March when the same team destroyed U973 again by rocket attack NW of Narvik. Just over a week later, on the 15th of the month, an 825 Squadron aircraft launched from *HMS Vindex*, one of four "home grown" RN escort carriers, helped sink U653 in the north Atlantic, when co-operating with the convoy escorts, *HMS Starling* and *HMS Wild Goose*. The first week of April saw a further success. On 3rd of the month co-operation between a Swordfish of 819 Squadron from *Activity* and a Grumman Avenger crew of 846 Squadron from *Tracker* resulted in the sinking of U288 in the Barents Sea by combined rocket and depth charge attack.

Impressive though the Swordfish's U-Boat tally had now become, an even more remarkable achievement is recorded for the first week of May 1944 during an Arctic Convoy. Flying from *Fencer*, Swordfish of 842 Squadron sank three U-Boats in two days. U277 based at Hammerfest was sunk on the 1st of the month by depth charges SW of Bear Island. The next day U674 out of Narvik was dispatched West of Tromso, sunk by rocket fire, again from an 842 Squadron aircraft from *Fencer*. That same day 2nd May saw U959, also out of Narvik, sunk by depth charges off Jan Mayen Island by an aircraft of the same squadron. The intensity of these U-Boat encounters reflected the importance the German U-Boat Command attached to their attacks on the Russian convoys at this stage of the war but it also underlined the developing expertise and determination of Fleet Air Arm aircrew. Success was achieved against the odds, especially that posed by the extreme harshness of weather conditions in both Atlantic and Arctic waters. A further success came less than a week after the sinking of U959 when on the 6th of the month, a Swordfish of 825 Squadron, flying from the *HMS Vindex*, co-operating with *HMS Aylmer*, *Bickerton* and *Bligh*, helped to sink U765, by depth charges in the north Atlantic.

Arctic Convoys and the seas off Norway continued to be a principal battleground in the German U-Boat offensive during 1944. August saw further Swordfish victories. On the 24th of the month, flying from *HMS Vindex*, an 825 Squadron aircraft co-operated with escorts *HMS Mermaid*, *Peacock*, *Keppel* and *Loch Dunvegan* in the sinking of U344 in the Arctic. The following day 25 August 1944, another 825 Squadron aircraft from *Vindex* sank U354 off the North Cape.

A little over a month later on 30 September, there was one more possible Swordfish success, the sinking of U921, this time claimed by an 813 Squadron aircraft flying from another British built escort carrier, *HMS Campania*. Then on 13

December 1944 to round off a year of sinkings, an aircraft of the same squadron sank U365 off Jan Mayen Island. While not classified as U-Boats, two Vichy French Navy submarines, the Bezeviers and the Le Heros, were victims of Swordfish attack early in the war. These were sunk on 5 and 6 May 1942 when encountered by 829 Squadron Swordfish from *HMS Illustrious* near Diego Suarez, during Operation Ironclad, the invasion of Madagascar by British forces.

The capabilities of the aircraft and the skill and determination of their aircrew would always be beyond reproach; but to be effective, these skills needed effective weaponry. In common with their RAF Coastal Command contemporaries, Fleet Air Arm anti-submarine aircraft benefited from gradual improvements in anti-submarine weapons. This was guided by evidence gained from the relatively new techniques and principles of what came to be called Operational Research (OR). Studies of Coastal Command experience identified defective aspects of any attack. One such deficiency identified early on was the relative ineffectiveness of the RAF's 100 lb or 250 lb Mark IV anti-submarine bomb. Hitting a U-Boat with such missiles was shown, literally, to be a hit or miss affair. To overcome this problem, trials of other ordnance were undertaken. These established that the standard naval 450 lb depth charge, when modified for aerial use, could be far more effective, having a crushing effect when detonated by a depth pistol within 25 feet from the pressure hull of a submarine. The development and fitting of this much more effective aerial weapon was accompanied by improvements in its explosive fillings. Amatol charges were superseded by the more powerful Torpex explosive based on TNT. Shape also proved to be a critical factor. Eventually the design of the front casing of the depth charge was modified to concave form so as to inhibit a tendency for it to bounce or porpoise on the surface. Successful attacks relied on sticks or pairs of depth charges dropped from as low an altitude as possible. Ideally this could be as no more than 50 feet, aiming to straddle the U-Boat, usually at the point at which it would be starting its dive. Attacks had to be accurate, as in fast diving trim; U-Boats were able to submerge in as little as 30 seconds.

Aircrew needed to hone their skills in carrying out the required manoeuvres, allowing for the fact that overall, per miles flown or per hours on patrol, sightings were quite rare. The introduction to enemy submarines of the Schnorkel underwater engine breather, reduced the quarry's need to surface for battery recharging purposes, thereby limiting the time U-Boats were exposed to ASW aircraft. Keeping tally of possible sinkings was essential in monitoring progress with weaponry in the anti U-Boat offensive. In RAF aircraft, effective placing of weapons could be confirmed by reference to film taken by a mirror aimed backward facing F24 camera. Such photographic records provided evidence of the timing and spread of weapons release and their effect. The low altitudes required for depth charging meant optimum height above the U-Boat was critical. This meant that attacking aircraft had to expose themselves to blistering anti-aircraft fire. As the incidence of low level attacks on U-boats from the air increased, aided by the introduction of ASV, Leigh Lights and RP use, there was a concomitant provision by U-Boat Command of 20mm and 37 mm cannons on boats as defence. Fighting it out on the surface came to be seen as a better option in some instances, than attempting to dive and succumbing to depth charge damage in the process. This faith in anti aircraft measures culminated in the installation of the quadruple 20mm Cannon mounting, known as the Flak Vierling.

The Swordfish's armament consisted at best of one fixed and one flexible rifle calibre machine gun. This combination was quite ineffective at producing the weight of fire needed to neutralise the formidable array of weaponry that was carried by U-Boats. The offensive armament of the Swordfish in these situations was hardly comparable to the four 20mm cannon carried in a ventral tray by some Liberators of Coastal Command, The unguided Rocket Projectile (RP) proved to be the most valuable addition to the armoury of the Swordfish. Modified by the addition of protective metal plating under the lower mainplanes, Mark II aircraft were fitted with eight rocket rails. These could accommodate two kinds of 3 inch RP, one with a 60 lb HE head, the other of the 25lb Armour Piercing (AP) solid shot type. The latter proved to be highly effective, capable of penetrating the pressure hull of a U-Boat if fired to strike it at the right angle.

Slowed down by their weaponry and such extra equipment as ASV, it would have been touch and go for Swordfish, under certain conditions to overhaul their target to execute an attack. However, despite this disadvantage there is little doubt that the destructive power of the 25 lb RP, as a stand off weapon, coupled with the dedication and fortitude of their crews, helped to improve the odds in favour of the Navy's antique but iconic biplane.

The extent of the death toll of German U-Boat crews reflected by the above sinkings, is a sobering reminder of the grim, ferocious nature of the many battles that were fought by them against their Allied attackers at sea during WWII, resulting in the highest of all Kriegsmarine casualty rates. In broad terms, around two thirds of German U-Boat personnel never survived the conflict.

This article relies in part on information provided in Alex Niestle's highly authoritative account German U-Boat Losses During World War II, published by Barnsley in 2014. Help from this book is gratefully acknowledged.

The destruction of L53

By Flight Lieutenant S. D. Culley

Although written partly in the third person, this article seems to have been all the work of Culley. It is drawn from a manuscript dated "Milan, Italy, 1959" in the FAAM archive. It previously appeared in print in "Voices in Flight, The Royal Naval Air Service in the Great War" published by Pen and Sword, 2014.

The Zeppelin was the great "bogey" weapon of Kaiser Wilhelm and his army staff in the First World War. It was employed before the war as a political weapon and the claims for it were, as is usual with such things, far greater than justified. Although the Zeppelin was available from the very start of the war, it was not from the political aspect very different to the claim made by Hitler for secret weapons, which were going to blast the British off the islands towards the end of the Second World War. However, several Zeppelins were destroyed by even very inefficient aeroplanes available at the beginning of the war, when they were used as offensive bombing craft over Britain, so the airship was very quickly relegated to its proper function as a means of reconnaissance for the German Navy.

In this role there is no doubt that the Zeppelin was a most useful aircraft, if expensive. Operating over the North Sea it could remain in the air for long periods, day and night, and able to report on the movements of ships over vast areas of that important sea. The only British aircraft able to operate at any distance from Britain was a flying boat, and that was so heavy and slow that the Zeppelin could practically ignore it. The main base of the Zeppelins was in northern Germany and they were of particular annoyance to the British Harwich Light Force, which operated from Harwich under the command of Admiral Sir Reginald Tyrwhitt. Although some cruisers in the Grand Fleet were fitted with small fighter aircraft, none of the ships of the Harwich Force had been so fitted, so that the ability of the Germans not only to report on every movement of the Harwich Force, but even to bomb the ships (admittedly without anything more than a nuisance effect) was particularly galling to the Admiral. He therefore put the problem to the famous Commander (at that time Colonel) Samson, whose headquarters was at Felixstowe, and requested that he should devise some way of dealing with this great nuisance.

It so happened that in order to give the flying boats of Great Yarmouth and Felixstowe greater range, a lighter had been designed especially to enable a flying boat to be warped aboard. The lighter was towed behind a destroyer to wherever the fleet might be going on patrol and at an appropriate moment, the flying boat would be launched from the lighter, take off from the water and proceed on its mission, returning to its base in the UK by air. It was decided to experiment by fitting a small land fighting aircraft to one of these lighters. The aircraft chosen was the famous Sopwith Camel, which had the particular ability to climb quickly to what were then considerable heights of 20,000 feet. The original Camel for this special purpose was fitted with skids, not unlike ordinary skis, and these were designed to run along troughs fastened to the deck of the lighter. The destroyer steamed at its highest speed, about 30 knots, and thus ensured airflow over the deck of sufficient speed to give the aircraft immediate lift when released. When all was ready according to plan, the trial was made. Typical of that great character, Colonel Samson himself insisted on being the first pilot to try the idea. It was not successful. As soon as the aircraft started to lift, it appeared to become out of control and plunged into the water immediately in front of the lighter, which swept over it. Naturally everyone expected this to be the end of the career of Col Samson, but not at all, he was recovered intact and as he was hauled into a boat his only remark was "that was no damn good, we had we must do it better next time".

For the next experiment it was decided to fit a flat deck with a Camel on its ordinary wheeled undercarriage. A young pilot, a Canadian in the Royal Air Force by the name of the Lieutenant S. D. Culley, who had had experience of deck flying in the Grand Fleet and who was then stationed at Great Yarmouth, was chosen as the pilot. The experiment, which was made on 1 August 1918, was a complete success. The Camel was prepared for its defensive role and the standard Vickers machine gun, and all accessories, was removed. In place of the single Lewis gun fitted in the top plane of the aircraft it was decided to fit two such Lewis guns, as it would not be possible

Sopwith 2.F1 Camel N6812 at the Imperial War Museum. This is the actual aircraft used to shoot down Zeppelin L53. © *Peter Clarke*

for the pilot to make any change in them during flight and it was essential that the greatest possible firepower should be available for the very few critical seconds in which they might be called upon. The guns were fitted with two ammunition "pans" of 97 rounds each. The Royal Navy destroyer allocated for the operation was the same as had carried out a successful trial, *HMS Redoubt*, commanded by Cmdr Holt, DSO, RN. The lighter H5 (as the craft was officially called) with the Camel fitted, was taken out with the Harwich Force on the evening of 5 August 1918 for its first operation, but the weather morning was unsuitable and the force returned to Harwich. On the evening of 10th August, Harwich Force again left on operational sweep of the south-eastern part of the North Sea and the Camel was again taken out, as were a number of flying boats on other lighters as well as some coastal motor boats (C. M. B.) which were carried in the various ships of the Fleet. It was therefore rather a large force which found itself the next morning in the south-eastern part of the North Sea not far from the German and Dutch coast.

At dawn the CMBs and the flying boats were launched and the flying boats then attempted to takeoff. However, the water was so calm that without exception they all failed in their attempt and finally had to be hoisted into the respective lighters for an ignominious return to port when the fleet had finished operations. The motorboats set off on their prescribed sweep in the hope they might meet some ships of the enemy. Soon after dawn the crew of the Camel lighter went aboard from the destroyer and soon they had everything prepared. The flagship received a message from the Admiralty about 8 a.m. to the effect that an airship was cruising somewhere in the vicinity of the Bight of Heligoland, and they should keep a lookout for it. The crew on the lighter were duly alerted and from then on everyone throughout the fleet was scanning the skies to find the hoped-for victim of the new weapon.

At about 8.30, Culley suddenly saw the Zeppelin in the sky at a great height – estimated then to be about 10,000 feet. After that things moved very quickly but with absolute precision under the calm direction of Colonel Samson in the lighter and Commander Holt in *HMS Redoubt*. Soon the lighter was approaching full speed, and with Culley already in the cockpit, the tricky operation of starting the engine by means of swinging the propeller by hand was undertaken. The airman who had been appointed for this work was fitted with a special belt around his waist, which was anchored to the deck at a point which just permitted him to reach the propeller. He performed this operation with a 30 knot wind in his back as though nothing exceptional at all, and as soon as the engine started he carefully pulled himself back by the anchor cord, unclipped the hook and disappeared below the deck, leaving now only Colonel Samson visible with his head just showing to give the pilot the signal when he was completely satisfied that the aircraft could take off.

Lighter H3 with a Sopwith Camel. It is being towed by a destroyer steaming at 10 knots. This was the second (and successful) attempt to fly off the lighter and achieved by Lieutenant Stuart Culley, RNAS on 31 July 1918.

Culley then pulled the release fitted in the cockpit of the Camel and after a run forward of less than five feet the Camel literally leapt into the air. The time was precisely 8.41. The weather was perfect and the excitement was intense throughout the whole of the Harwich Force. As the sole actor and reporter in the operation we shall have to leave the narrative now to the pilot Culley to describe.

"Before I pulled the quick release toggle in the cockpit of Camel N 6812, I had of course pushed the throttle forward to give maximum revolutions. With the release, the thrust one felt was quite considerable and it is perhaps more correct to say that the Camel took itself off rather than I did. Within a few seconds I found myself over the superstructure of *HMS Redoubt*, which was towing the lighter, so I was satisfied that the engine was giving me its best for climbing. It was a fine sight to see the rest of the fleet spread over the water below, but my anxiety was to find the Zeppelin again, for it had been some minutes since I'd last sighted it. I was fortunate in picking it up very quickly and from then on my eyes hardly left it, except for brief glances at what instruments to ascertain height, direction and the behaviour of the engine.

"The Zeppelin appeared to be very high indeed, and still the size as when I first observed, which was about the size of one's little finger. I surmised therefore when I reached about 5,000 feet, that she had started to climb quickly, and this was bad news to me for she belonged to the very latest type of Zeppelin in a class known as the "Height Climbing 50s" which were reputed to be able to out-climb any aircraft then available in the Allied forces. However, there was nothing for it but to continue to climb as fast as possible, always in the direction in which the Zeppelin appeared to be moving. So I climbed 12,000 and 15,000 feet and already I could feel the little Camel beginning to be sluggish on its controls indicating that it was feeling the height. At one moment the engine coughed, and this change in the rhythm of its song had an immediate reaction in my heart. However, it went on again beautifully and never again gave rise for any worry.

"Finally, when I was about 18,000 feet I was getting very much more on a level with the Zeppelin and it was not long before I realised that the Zeppelin had turned directly towards me. With a relative speed of over 120 knots, it was not long before the few miles which separated us was reduced to nothing and I saw that I should meet the aircraft head on with it a few hundred feet above me. I had been given strict

instructions in writing by Col Samson that I must climb above the airship and dive on it in attacking as there was practically no defence from above.

"But it was obviously now or never, and in a few seconds I had the huge bulk of the Zeppelin looming ahead of me. I could see the control car and the engine gondolas with their propellers turning, and I pulled the small Camel back into an almost stalled position and as the Zeppelin came over me, I pulled the trigger of the two Lewis guns on the top plane and heard them rattle off their charges. As I passed under the belly of the airship I saw a large dark object drop and disappear below, but of course there was no possibility of following it. It was probably the only survivor of the Zeppelin, who was reported later as having been picked up by German search vessels, having descended the 19,000 feet by parachute – certainly a record for those days.

"After the guns ceased to fire, the little Camel fell away completely stalled and out of control. There was absolutely no possibility of watching the airship and I had to devote the whole of my attention to bringing the aircraft out of the spin into which it had fallen. This took several thousand feet. Finally I had it on an even keel and looked back to see the airship sailing along majestically as though nothing had happened at all. I was about to turn again to my controls when suddenly that from three widely dispersed points, there was a burst of pure flame. Within a minute at the most the whole of the airship except for the tail portion was a mass of flames, which died out almost as quickly as they appeared and the great metal skeleton framework with the smoking, but not burnt out, tail part still with the flag flying, dropped rapidly in one piece but with the back of the skeleton broken about one third of the distance from the nose. The great airship L.53 disappeared below into the haze taking with it over 30 of its crew. The time, I was told later, was 9 41, just one hour after I taken off from the lighter.

"After seeing the complete destruction of the airship, I realised that this would not be a very healthy place to be in, so I again put on full throttle and descending fairly rapidly I flew more or less west well out to sea but parallel with the Dutch coast, which I could see dimly to port. I knew I was getting fairly short of petrol, and must of course have used more than normally, for the engine had been at full throttle for over an hour. I began therefore to think about where I might end up in the event of not finding the fleet again at the rendezvous. I had not, perhaps strange to say, a good map with me, but only a very small scale atlas map which I tore out of some book and which showed up on one small page the whole of the Dutch coast from the German border to Belgium. I had been able to make a rough mark on the map as to whether Texel lightship should be and as I began to pick up points of the Dutch coast from height of 5,000 feet at which I was now cruising, I realised I must turn out to sea. I was somewhat comforted by seeing quite a number of, presumably Dutch, fishing boats on the water, but out to sea there was a complete cover of a very thin but effective veil of mist which prevented me seeing anything at an angle. As I turned out to sea, my engine stopped and I knew then that I had used the whole of my petrol in the main tank and I had only a few gallons in a small reserve tank left. I therefore throttled down to the minimum revolutions in order to keep airborne as long as possible. Shortly after this, I saw what appeared to be two very much larger fishing boats further out to sea, and I thought they might perhaps be Dutch naval ships, so I made for them descending the whole time. In a few moments I entered the very thin veil of mist and emerging found that the two fishing boats were in fact destroyers and I suddenly saw the whole of Harwich Force steaming in perfect order.

"Moments later I was diving on *HMS Redoubt*, which I could see was already stopping, putting the lighter crew on board, and preparing a small rowing boat for my reception when I dropped into the water. While this was going on I paid a visit to the ships of the rest of the fleet hoping that my petrol would last. Thanks to the great efficiency of Commander Holt and the ship's company, I was very soon making my landing approach and dropped into the sea almost literally in the arm of arms of the whaler's crew. The aircraft was of course somewhat damaged about the wings but did not sink and by means of the collapsible derrick (which had been designed for the purpose) the faithful little Camel N6812 was hoisted aboard the lighter and brought safely back to Britain. It is now in retirement in the Imperial War Museum in London, having been selected to be a permanent record of the famous Camel which brought such destruction to the enemy air force, and ground forces also, on many fronts in the First World War. And so I was able to play my part in this most excellent example of a combined operation between the Royal Navy and the very newly born Royal Air Force, which had been in existence for just over four months."

While Culley was airborne Harwich Force continued on its naval sweep, Naturally every man above decks kept a lookout in the heavens as well as on the surface of the sea and as time went on and nothing was seen, it is natural that some anxiety was felt. However, in due course the great flame in the sky was observed by the fleet and a cheer went up as it was felt certain that the flame could only have meant that the Zeppelin had been destroyed.

When Admiral Tyrwhitt saw the flash in the sky he turned to the Officer of the Watch and asked 'Who is here who knows his hymnbook well?' The officer, having been a choirboy at one time, stated that he did. The Admiral then asked the number of the hymn commencing 'O happy band of pilgrims'[1] . This necessitated the production of a hymnbook and the hymn was duly found. A signal was therefore made to all ships in the fleet, calling their attention to the hymn. As a result, being a Sunday, ships' companies of the fleet sang the hymn heartily. It was appropriate also from their point of view as Harwich Force was often referred to as the "Happy Band of Brothers" and also the "Light Affliction".

1 *"Oh happy band of pilgrims, Look upward to the skies, Where such a light affliction, Could win so great a prize."*

809 Squadron in Ark Royal

By Malcolm Smith

All photos by the author taken during Ark Royal's Operational Readiness Inspection in summer 1976 unless otherwise credited.

Buccaneer S2 overflying *HMS Ark Royal* in the Atlantic Ocean. © *MoD*

It is 1976 and the sun shines in a cloudless sky. In the calm blue waters of the western Atlantic, *HMS Ark Royal*, the fourth Royal Naval vessel to carry that name and the third to operate aircraft, turns into wind and begins to launch its aircraft.

The first to go is an Airborne Early Warning (AEW) Gannet, followed by a stream of four Buccaneers and three Phantoms, launching alternately from the waist and bow catapults. An hour later, and a similar group of bombers and fighters will be launched before the ship goes to recovery stations to bring the first group home. How is this apparently effortless process, familiar to many from film and video, achieved? To get some idea, we need to turn the clock back a few hours to the previous evening after night flying has finished. The next day's flying programme has been issued and the maintenance effort in the squadrons is focused on the complex task of preparing for it.

Let us go down four decks, through the airlock and into the lower hangar. Here we will find eight Buccaneers, wings folded and airbrakes spread, tightly packed in two rows of four, facing forward to the forward lift well. Several of them are in some form of deep maintenance and will not be expected to fly in the near future. The night watch of maintainers are carrying out varying tasks, rectifying faults and keeping the Duty Air Engineer Officer (AEO) aware of progress. Above, on the flight deck, are the remaining six aircraft of the squadron's complement, lashed down in the deck park where they were re-spotted on completion of the previous day's flying. After they had landed back on, their aircrew had reported their serviceability state. Some may be ready to fly again after routine flight servicing; one or two others may be displaying symptoms that will require longer term work for the specialists to identify and rectify. Those that are definitely out of the running for the next

day's sorties will have to be taken down into the hangar for rectification, while other potential flyers are brought up from the hangar to the flight deck. All aircraft moves on board are undertaken by the Aircraft Handler branch, specialists in the art of manoeuvre in confined spaces, learned at the School of Aircraft Handling at the Royal Naval Air Station at Culdrose. The Handlers are under the control of the Aircraft Control Room Officer (ACRO) who sits in a compartment immediately adjacent to the flight deck. He has scale plans of the two hangars in front of him. These are inscribed on metal plates and carry scale silhouette models of all the ship's complement of aircraft. The models are magnetised and enable him to see at a glance where the aircraft are stowed in the hangars. An added refinement is that each aircraft model is coloured red on one side and green on the other. As the squadrons inform him of the serviceability of the aircraft under maintenance, he turns them over to show their readiness. It is in the interest of the squadron AEOs to maintain a cordial relationship with the ACRO and his deputies, as it is only with their direction that aircraft can be moved into the right places to satisfy the maintenance and flying programme.

Moving a single aircraft from hangar to flight deck requires a carefully planned sequence of activities. In the hangar, aircraft are moved by mechanical handler, a squat battery-powered device with an arm that embraces one of the main wheels of the aircraft to be moved. The mechanical handler is operated by one of the handler team and a junior maintainer (the plane captain) mans the aircraft brakes in the cockpit. With a warning clanging from its bell, the lift descends to hangar level, operated by another of the handler team. At a signal from the marshaller, the handler operator engages the motor to start to move the aircraft forward on to the lift platform. The mechanical handler is moved out of the way and once the lift driver is satisfied that the aircraft is accurately positioned (there is only a small clearance between the plane and the lift well) he selects the up control and lift and aircraft rise to flight deck level. Here a handler is waiting with a towing arm, which he attaches to the nose-wheel. The other end of the arm is connected to an All Wheel Drive (AWD) tractor and, again at a signal from the marshaller, the plane captain releases the brakes and the aircraft is pushed back off the lift and moved down to its place in the deck park. An additional complication for those planning the moves is that, once the ship goes to flying stations, the lift (which is part of the runway) remains locked at flight deck level, so any aircraft in the hangar will have to stay there until the ship stands down from that period of flying.

It is time to introduce a personal note to this narrative, as I joined 809 squadron, embarked in *Ark Royal*, in the autumn of 1976. I was appointed as the Deputy AEO, to take over as the AEO in the New Year. I was surprised to find that the AEO whom I was about to relieve (who shall be Nameless) was of the settled and often-expressed opinion that the Squadron Commanding Officer expected too much from his maintenance organisation, by setting requirements for the flying programme that simply could not be achieved. Needless to say, this opinion was known to all his maintainers. There were around 200 of them, organised into four trades and consisting of a mixture of Artificers (now known as Technicians) and Mechanics. There was sufficient manpower in those far-off days for them to be organised into three watches, so that when the ship was operating aircraft, work could continue around the clock. We had an excellent Warrant Officer, who looked after general discipline, including organising the watch system. Let us call him Mr Brown. (He was actually called a Fleet Chief; a rank that was introduced in 1970 when the Admiralty Board decided to reintroduce Warrant Officer ranks after they had all been promoted to Branch List officers in 1948.) As well as the AEO, there were three other AEOs, so that similarly, one could be on watch at all times. The requirements of the flying programme were usually identical for each flying day. We had to provide four Buccaneers to launch at 09.00, followed by another four at 10.00. After the second wave had launched, the ship assumed recovery stations and the first four landed on. The second four recovered an hour or so later. This was known as "four over four". In the afternoon, the requirement was for "three over three" and once the ship had worked up for a while and night flying was planned, a reduced programme of two over two. To achieve this flying rate, not only did aircraft have to be serviceable for the planned sortie, they all had to

A busy scene as armourers in red surcoats wheel 540lb bombs to the aircraft. © *Malcolm Smith*

Buccaneer 025 (centre) is armed with two 540lb bombs on a tandem beam under each wing. © *Malcolm Smith*

be in the right place when the ship went to flying stations. This required duty AEOs to be capable of thinking in three dimensions when planning maintenance and aircraft moves. It paid to be able to think ahead and understand that the ACRO had aircraft of other squadrons to move as well as one's own.

After the Christmas break, the ship sailed for the United States and started to operate aircraft. During the first few days of flying, things did not go particularly well and one evening after completion of day flying, I was approached by Mr Brown. The conversation went somewhat along these lines:

"Well Mr Brown, what can I do for you?"

"I've been talking to some of the lads, sir, and I'm getting a bit worried about flight safety". (This is something rather like having a cattle prod applied to a sensitive part of one's anatomy.)

"What on earth do you mean?"

"They just seem to think that you are pushing them too hard – expecting too much from them."

"I hope I do it safely, but we have to work hard if we are to meet the flying programme."

It was a light bulb moment: "You mean you want to meet the flying programme? But your predecessor said..."

I did not need to point out that Nameless was no longer with us.

There are an extraordinary number of different and complex processes that had to come together for an old steam-powered aircraft carrier to operate aircraft safely and effectively. I always felt that, when every other element of the ship's organisation was pulling their weight – the unseen toilers in boiler rooms and engine rooms, those who maintained the complex flight deck machinery, the aircraft handlers and tractor drivers, the trained aircrew who turned up in flying clothing to brief their sorties – the least that we could do was to make every effort to provide the planes to do the flying. And so we did – if my memory serves me right, we once completed 17 consecutive flying days and only dropped a few sorties

The highlight of my time in *Ark Royal* was the Operational Readiness Inspection (ORI) carried out by Flag Officer Carriers and Amphibious Ships (FOCAS) in the summer of 1976. After various evolutions, the squadron was given the simple task of launching as many armed aircraft as possible, including two in the tanker role. The accompanying photographs show the resulting activity, leading to (I think) launching 12 out of our 14 aircraft. I expect it will all be different in the magnificent new *Queen Elizabeth* – acres of flight deck, deck-edge lifts to facilitate aircraft moves, no catapults or arrester gear to worry about and so on. I expect AEOs still come under the same pressure though.

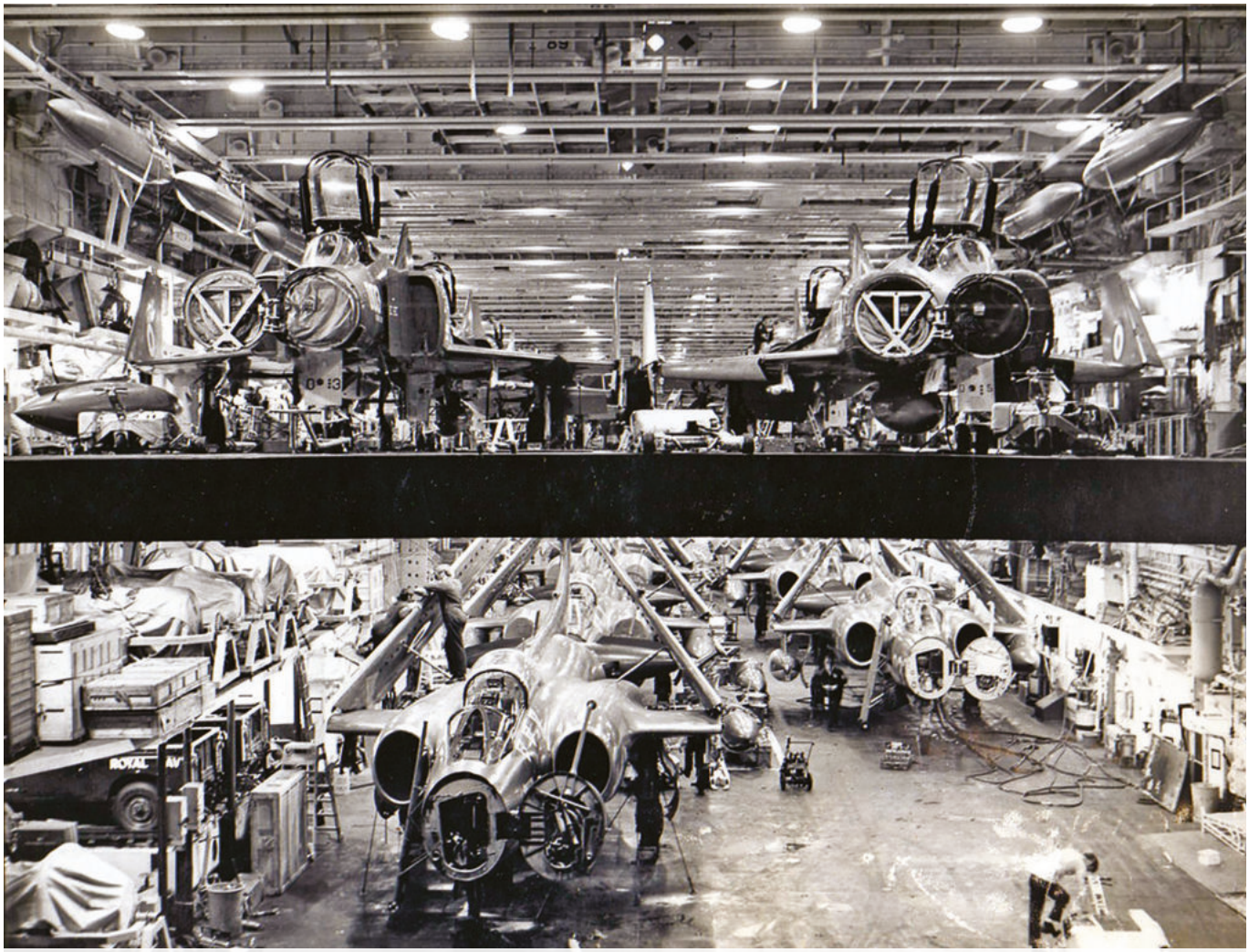
809 Squadron embarks on *HMS Ark Royal*. © *MoD*

Buccaneer of 809 Squadron flies over a Soviet Kresta II cruiser. © *MoD*

Buccaneer tanker in an unusual deck park. The engines are running, the maintainers are wheeling away the Palouste starter and the AWD tractor is about to tow the aircraft out of the park towards the catapult. Gannet AEW aircraft behind with wings folded. © *Malcolm Smith*

Buccaneer 020 about to launch. The Flight Deck Mechanical Engineer (FMEO) is kneeling on the right. He and his men were known as "badgers" from the black stripe on their surcoats. © *Malcolm Smith*

892 Squadron Phantom F4K being refuelled from an 809 Squadron Buccaneer S2B. © *MoD*



Hangar decks on *Ark Royal*. Phantoms above, Buccaneers below. © *MoD*

US Navy carriers in UK waters

By Richard Macauley

All photos by the author

***CVN-77 George H.W. Bush* at anchor, Stokes Bay.**

Through membership of the ANA (Association of Naval Aviation), I am fortunate to be able to gain access to US carriers when anchored in British home waters. This takes place through Squadron 66, The Buccaneers, the UK affiliate to the ANA.

Visiting US carriers always anchor in Stokes Bay, between the Isle of Wight and the mainland. This is the area that has hosted numerous Fleet Reviews over the years. This deep anchorage is necessary as the Nimitz class draught is too deep for them to enter Portsmouth harbour.

Access has always been a morning or afternoon visit, which will have the visitors reporting to the ubiquitous security control to get pier side and transport via Liberty Boat out to the carrier. This is facilitated by military and civil personnel from US Naval Support Activity Naples and the UK American Embassy. They are always very interesting people to talk to during the obligatory wait. Other notable persons over the years that have crossed my path have been the VFA-213 'Black Lions' CO, Cmdr Kevin Robb and his Executive Officer, Cmdr Patrick Baker. Their insights on operations in the Persian Gulf were fascinating plus Kevin's personal comments on the incoming F35C aircraft for carrier operations were thoughtful.

CVN-75 Harry S Truman Navigation Officer, Cmdr Kent Smith was very friendly but tight-lipped on manoeuvring the

***CVN-71 Theodore Roosevelt* floating landing dock.**

CVN-75 Harry S Truman.

Harry S. Truman in coastal waters. The bridge spaces on all the carriers visited are surprisingly compact given the size of the ships.

A young female Seaman was sporting a *CVN-78 USS Gerald R. Ford* ship's cap. This is the first ship in the new Ford class of carriers to be inaugurated into the US Navy. She found it hilarious that various visitors were offering her ever increasing amounts of dollars for her to part with it. She was on temporary assignment to *CVN-75* awaiting her permanent posting to the Ford while it undertook early sea trials.

When US carriers come to UK waters, they are usually outbound or returning from deployments in the 6th and 5th Fleet areas of operations. This generally means operating in the Mediterranean, the Persian Gulf and further East, usually supporting Operation Inherent Resolve which has been ongoing since 2013. They have also been involved in anti-piracy operations in the Arabian Sea.

Interesting sights I have seen on board the carriers include the F/A-18E that shot down a Syrian SU-22, flown by LCdr M. Q. Tremel of VFA-87 Squadron, Golden Warriors (Callsign 'War Party'). An F/A-18F of VFA-213 flown by an all female crew and its large number of mission tallies, gained while flying in Operation Inherent Resolve 2017. Servicing the aircraft and equipment continues despite visitors, such as technicians working on the Hornet aircraft's rotary cannon and steam still rising from the catapult rails because the boilers are not shut down during periods 'along side'.

Very long queues built-up within the hanger decks of the Truman due to a lack of Liberty boats. Many of the crew were headed to London for a few days 'RnR' . They should have been commended for their patience. They had already completed a significant period on station in the Mediterranean and this R 'n R period was valuable time before heading to Northern waters for a NATO exercise before heading back to the USA.

The mission tallies on the aircraft are a subject in them selves as they denote the types of ordnance delivered on individual sorties. The 'standard bomb' shape is much in evidence as shown in the photo of F/A-18F 214. But look at the photo of F/A-18E 302, the tallies change to a tomahawk representing a bomb due to squadron associations with the

This is the F/A18E that shot down a Syrian Sukhoi SU-22 on 18/06/2017.

***CVN-75* main flight deck and note the steam coming from the catapult rails.**

All female aircrew, Lt Emily King and Lt Natasha Koenneker and note their mission tallies. VFA-213 'Blacklions'.

The author onboard *CVN-77*.

native American Indian. Also in the photo, look to the second line from the bottom, right hand end and the shapes change to missiles (with feathers) denoting the two air-to-air missiles used to bring down the Syrian SU-22.

US carriers use a number of anchorages throughout Europe while on deployments. Toulon in the South of France, Palma, Majorca and Souda Bay, Crete have been favourites in the last decade. Invariably it is Toulon or Stokes Bay that sees a 'RnR' stop before returning to the USA, usually to the huge naval base at Norfolk Virginia, which is the East coast home ports for carriers.

An exception to this rule was *CVN-75* in 2018. After leaving Stokes Bay she transited the North Sea to take part in Trident Juncture, the largest NATO multi-lateral joint forces exercises of its kind in Norway since the 1980s. Around 50,000 participants from 31 NATO and partner countries were involved, utilising around 250 aircraft, 65 vessels and up to 10,000 vehicles.

Alongside in Portsmouth were three ships from the *Harry S. Truman* battle group. *CG-58 USS Philippine Sea*, a Ticonderoga-class guided missile cruiser (which we also gained access onboard), *DDG-75 USS Donald Cook*, an Arleigh Burke-class guided missile destroyer and *F313 HNoMS Helge Ingstad*, a Fridtjof Nansen class frigate. The latter collided with *TS Sola*, an oil tanker in Hjeltefjord near Bergen, Norway on returning from this exercise. She sank after her captain tried to save the ship by running her aground. However she capsized onto her side and slipped into deeper water. She is now up for disposal as being deemed beyond economical repair.

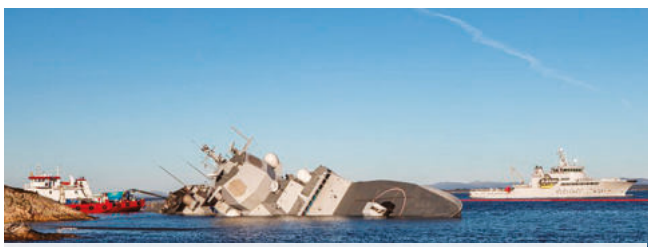
My biggest regret is not seeing *CVN-72 USS Abraham Lincoln* (being a personal hero), when she skirted the UK in mid 2019. But then I saw her alongside in San Diego during an aircraft spotting and photography trip. She had circumnavigated the world, leaving Norfolk VA in March 2019, arriving San Diego CA in January 2020. Between these dates, she operated and exercised with naval and aviation assets of a number of countries. This was one of the longest peacetime US carrier deployments and after those 6th and 5th Fleet operations and exercises, she was changing to the Pacific 3rd Fleet area of operations.

While onboard a San Diego harbour cruise, *CVN-68 Nimitz* came into harbour - two for the price of one and a very welcome sight. On another occasion and some bad planning on my part, meant I missed *CVN-76 Ronald Reagan* by three days in Singapore while on holiday - you cannot win them all. However, this does also demonstrate how the US Navy

***CVN-68 USS Nimitz* entering North San Diego Bay. While this photo is not the UK, it demonstrates the presence a US carrier up close.**

***DDG-75 USS Donald Cook* and *CG-58 USS Philippine Sea*, alongside in Portsmouth.**

***HNoMS Helga Ingstad*, alongside in HMNB Portsmouth.**



HNoMS Helge Ingstad partially submerged after the collision in 2018. © *Jakob Østheim / Norwegian Defense*

HNoMS Helge Ingstad nearly fully submerged after holding cables snapped and she slipped into deeper water. © *Norwegian Coastal Administration*

Servicing the 20mm M61 rotary cannon.

Preparing to fit weapon Multiple Ejector Racks (MER) to F18E aircraft.

Hangar deck of *CVN-77* in 2011. The carrier arrival in Stokes Bay co-incided with a visit by President Barak Obama to the UK hence the back-drop of flags and CAG aircraft as a set piece stage for high level visitors.

On the bridge of *CVN-71.*

interacts with many nations outside of their NATO interests.

One never always knows when a US Carrier is going to anchor in British waters though online forums are always awash with ship movements. Certain websites show positions of ships and carriers which are a few days old for security reasons, but it is easy to work out the potential patterns of ships movements as they head towards or away from UK waters. Another key indicator is the on board C2 Cod aircraft. 'CoD' stands for Carrier onboard Delivery and used to ferry supplies and personnel to a carrier at sea. As these aircraft form a ship to shore link, they will often fly ahead of the carriers when they are bound for a new operating area or destination. Therefore, wherever these aircraft go and which country they land in, it is sometimes a good indicator of where a particular carrier may be headed.

The UK ANA members of 'The Buccaneers' feel very privileged to have such access to these incredible ships and salute the men and women who crew them.

Hangar deck of *CVN-75*. The carriers crew are lining up in the aircraft hangars awaiting liberty boats to take them ashore.

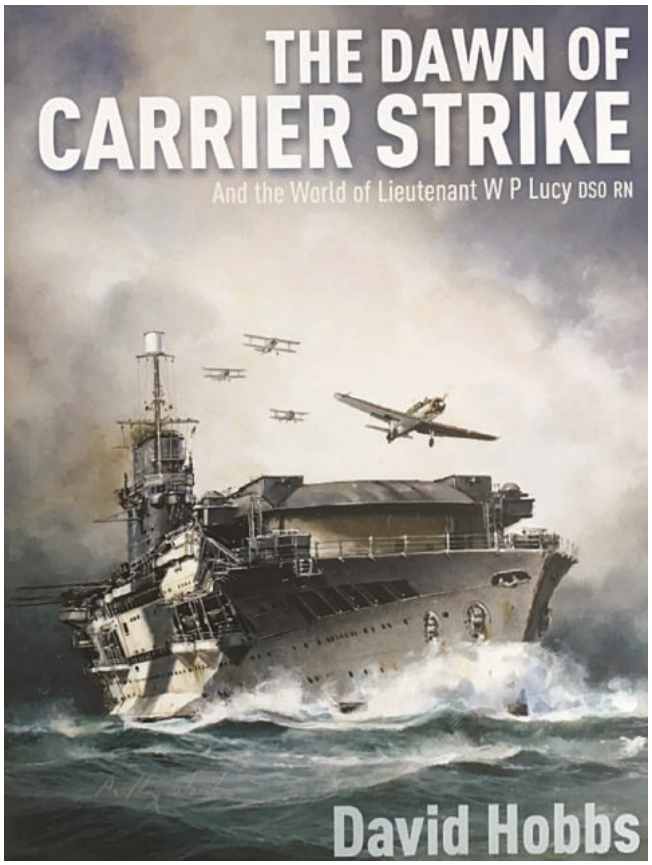
The packed forward flight deck of *CVN-75* viewed from the bridge.

***CVN-71* anchor capstan, note the scale with the person.**

Looking forward on *CVN-71* viewed from 'vultures row'.

The Dawn of Carrier Strike by David Hobbs

Review by Richard K Parkhurst



David Hobbs is a well known author of books about the Royal Navy and naval aviation and this publication is another of his many books about the Fleet Air Arm (FAA).

The first two chapters cover the years after 1918 when the Royal Flying Corps (RFC) and the Royal Naval Air Service (RNAS) were combined to form the Royal Air Force (RAF) on April 1st, 1918.This was a turbulent time for the naval aviation branch that was to become the Fleet Air Arm before the outbreak of the Second World War. There was much inter-service rivalry and political interference which dragged on for nearly six years before some degree of compromise was reached as to how the RAF and the Air Branch of the Royal Navy should operate their aircraft. The RAF and the Air Ministry were not particularly interested in, or supportive of naval (or army) aviation, and made little effort to co-operate with or provide the necessary support and assistance. Naval pilots came under the control of the RAF and were allocated a rank below that of their RAF equivalent. That did not really change until much later.

Chapter 3 is about joining the RN as an officer and learning to become a pilot. David Hobbs has cleverly used the career path of William Paulet Lucy (b.13/05/1910), from the time Lucy joined the navy at the age of 13 in 1924 through to 1943, to illustrate personnel development alongside that of the ships and aircraft of the period.

Chapters 4 and 5 cover the followiing:

- Technology: ships, aircraft, weapons and tactics; details of some of the major warships and aircraft in service post WWI are provided.
- Doctrine, operations and exercises; how the RN would fight the next war, operations undertaken during the 1919-1939 period involving various crises around the world.

Chapter 7 deals with the Observer branch, which in the early 1930s was unique to the RN in UK aviation. This chapter covers training in this specialist field and describes how it was integrated into flying operations. Unlike the pilots, who were under the control of the RAF, Observers remained executive officers under the control of the RN and as such were an integral part of a ship's company.

In describing progress in the United States Navy, Hobbs provides an insight to the development in US naval aviation, which differed considerably from that of the Royal Navy. This was because it was controlled by the USN, whereas in the UK, naval aviation development continued to be controlled by the RAF and the Air Ministry.

In 1933, after 15 years of being hamstrung by the Air Ministry, the Admiralty were becoming desperate to bring the control of the Fleet Air Arm (and RAF Coastal Command) into the control of the Admiralty, where it rightly belonged. Despite its efforts, this saga dragged on for another two years until in May 1935 a major effort was made to find a solution to the problem. After two years and two months, and an inquiry, Sir Thomas Inskip, recently appointed as the Minister for Co-ordination of defence, produced a report that recommended that the Air Branch of the Royal Navy should be fully under control of the Admiralty. Known as the Inskip Award, the report was accepted by Parliament, although it was another two years before the transfer was completed, in May 1939. Coastal Command remained with the RAF and Air Ministry.

At that time, whilst the RAF had been taking delivery of Spitfires, Hurricanes and medium bombers, the FAA still had biplanes in the form of the Fairey Swordfish and the Gloster Sea Gladiator and the underpowered, relatively slow – by comparison to a Spitfire - Blackburn Skua fighter/dive-bomber

and Fairey Fulmar fighter.

The next four chapters deal with: the infrastructure, personnel, and branches of the new service; detailed descriptions of the operational aircraft and capabilities; squadron command structure and its integration within the RN; and naval aviation in the first months of the WWII.

The remaining chapters deal with the Norwegian campaign from April to June 1940. When Germany invaded Norway, the Fleet Air Arm became a major offensive force against the German occupation. Initially, long range strikes against the ports where the German navy and army were located were undertaken from RNAS Hatston in the Orkney Isles. These operations are described in considerable detail based on all the information that is now available. The FAA were the first to sink a major enemy warship. On April 10th, 1940, 803 and 800 Squadron, flying Blackburn Skuas, attacked the port of Bergen and sank the German cruiser *Königsburg*. This was a remarkable achievement, using aircraft operating at their maximum range, across open ocean. More operations from the aircraft carriers *HMS Furious*, *Ark Royal* and *Glorious* are described, many of which included Lt W P Lucy DSO, who was CO of 803 Naval Air Squadron. These operations, against superior forces, using inferior aircraft, are nothing short of extraordinary and speak volumes for the bravery, skill, and ingenuity of the aircrew.

The German Heinkel 111 bomber was faster than the Skua, but the skill of the FAA crews resulted in many attacks on the fleet being thwarted and dispersed with more than a few of the German bombers being destroyed. Lt Lucy became the first FAA pilot to shoot down five enemy aircraft.

The book is illustrated throughout with black and white photographs from the author's collection, that of W P Lucy and other sources.

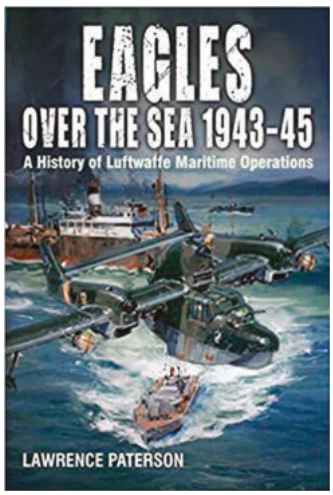
For anyone interested in the Fleet Air Arm and its history, this is an excellent book. Highly recommended.

The Dawn of Carrier Strike, published by Seaforth Publishing. ISBN 978 1 47387 992 8.

Eagles over the sea 1943-45 by Lawrence Patterson

Summarised by MTS

This is the second book of the author's detailed account of the Luftwaffe's naval operations during WW2. The first book was reviewed in Jabberwock 97 and brought the history up to the end of 1942, when the Luftwaffe had probably reached its highest point of effectiveness in naval warfare.



The current volume opens with a description of the requirement for the Luftwaffe to assist Karl Dönitz's U-boats with reconnaissance missions while attacking Allied merchant traffic in the eastern Atlantic. The air arm was not particularly well-equipped for this complex role, with the relatively short-range Bv 138 flying boat providing the reconnaissance mainstay. (A somewhat stylised painting of this unusual aircraft adorns the cover of the book.) The obsolete He 115 floatplane was also still in use. The Luftwaffe soon had to shift the focus of its maritime operations to the Arctic, in operations against the Arctic convoys to Russia; and to the eastern Mediterranean to support Rommel's ground operations in North Africa. This left a shortage of equipment to cover the Bay of Biscay, which was quoted as a factor in the success of operation CHARIOT, the British Commando raid on Saint-Nazaire in March 1942. Dönitz managed to succeed against competing demands for heavy bombers, so that a few of the new He 177s were allocated to the Atlantic coastal region. These long range heavy bombers had two paired engines in each of two nacelles, each pair driving a single propeller. They were bedevilled with design problems, with the engines very prone to catching fire. They proved to be of very little use to Dönitz and were soon withdrawn from active service after a brief deployment to the eastern front.

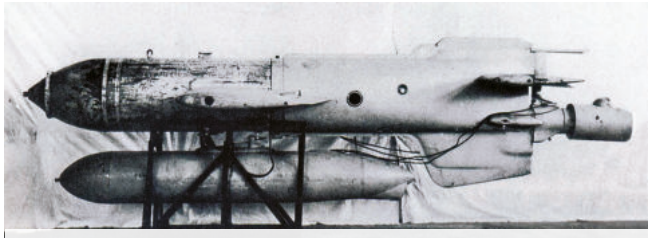
The Coastal Forces used the Do 217 medium bomber on mine laying raids and a developed version of this aircraft, the Do 217K, was introduced in mid 1942. This type was designed to carry the revolutionary Fritz-X guided glide bomb, one of many examples of German technical innovation. The Luftwaffe made many successful attacks on allied warships with the Fritz-X, but by D-Day in 1944, allied countermeasures rendered it almost ineffective. In late 1942, RAF Bomber Command began to use

more medium and heavy aircraft over the western approaches and Bay of Biscay, leading the Luftwaffe to deploy the Ju 88 to attack them. This threat to the RAF's vulnerable bombers led Fighter Command to deploy Mosquito night fighters to Cornwall and to maintain a strong fighter presence in the area.

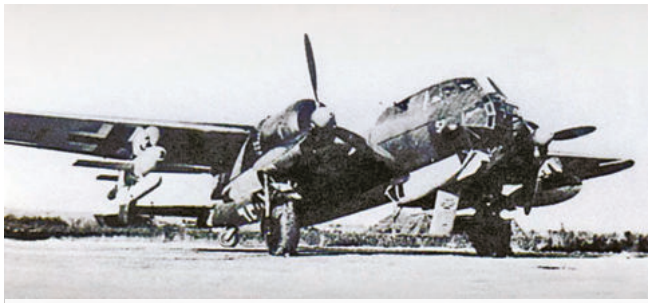
Paterson opens a chapter on the defence of North Africa by the Luftwaffe with agents' reports of an unusually large mass of shipping passing through the Strait of Gibraltar in November 1942. This was part of operation TORCH, the allied invasion of North Africa, but in "a disastrous German intelligence blunder" this was written off by the air arm as another mission to support Montgomery's Eighth Army at Tobruk. "Monty" was pushing the Afrika Korps steadily westward and Rommel was relying for re-supply on Axis convoys from Taranto in Italy. The Luftwaffe were tasked with escorting these convoys and used the massive six-engined Bv 222 to supplement the large force of Ju 52s stationed in southern Italy, shuttling supplies and reinforcements. Once the German High Command belatedly realised that TORCH involved a significant invasion by the Allies of North Africa, they initiated a substantial re-deployment of Luftwaffe squadrons from the eastern front, where they had been heavily engaged in the fighting around Stalingrad. These aircraft attacked the TORCH re-supply convoys, leading to significant losses of merchant shipping and warships, but without significantly interrupting the build-up of Allied forces in Tunisia. Paterson recounts how the enemy re-supply convoys to the Afrika Korps were effectively disrupted, while the Axis efforts turned to reinforcing their position in Tunisia with an immense airlift of troops and equipment, using huge numbers of Ju52 utility aircraft, supported occasionally by the vulnerable Bv 222. The outcome of this strategy was "a shocking loss of Ju 52 aircraft and bombers impressed into transport services for which they were patently unsuitable." Most of the troops so expensively deployed were soon to be taken as POWs. This chapter concludes with a description of the Allied invasion of the small island of Pantellaria (between Tunisia and Sicily) which was captured with no serious challenge from Luftwaffe forces.

The book's focus shifts to operations on the eastern front and to the relatively little-known air operations in the Black Sea. Although by late 1942 the Luftwaffe had developed an effective air-dropped torpedo and the tactics to ensure its delivery by He111H bombers, the local commander showed little interest in anti-shipping operations. Hitler's simultaneous attacks towards Stalingrad and the Caucasus revealed the continuing weakening effects of the divergence of forces. Luftwaffe maritime units based in the Crimea were unable to do much to disrupt shore bombardment by the Russian Black Sea Fleet against targets in Ukraine and Romania as Axis forces retreated from the disaster at Stalingrad.

Maritime bomber strength had been drastically reduced in Norway following the Allied landings in North Africa, but the Luftwaffe maintained a thinly-spread force of Bv 138 floatplanes and He 115 torpedo bombers there. Their task was reconnaissance, to locate arctic convoy traffic, a task for which the diesel-engined Bv 138 was well suited in the primitive



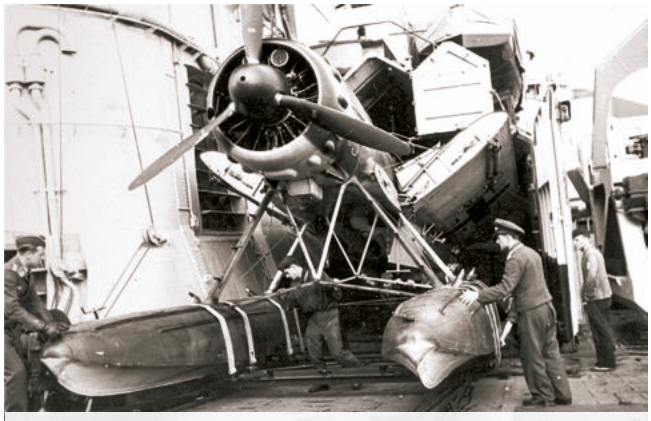
Henschel Hs-293 0B Glide Bomb. © ***Bundesarchiv***



Dornier Do-217 with Hs 293 0B Glide Bomb. © ***Bundesarchiv***

Heinkel He-115B2. © ***Bundesarchiv***

Junkers Ju-290. © ***Bundesarchiv***



Arado Ar-196 on board the *Tirpitz*. © ***James Payne***

operating conditions. Maritime aircraft supported the abortive sortie by the heavy cruiser *Admiral Scheer* in August 1942, but there were no more arctic convoys until mid December. On this occasion, the Kriegsmarine decided to use their heavy ships again, in an abortive sortie that led to the Battle of the Barents Sea. "Fortunately for the Luftwaffe" Paterson recounts, "They had played no part in this battle..." This was because of the terrible weather, including fog and driving snow squalls. However, the failure of the Kriegsmarine to deliver a decisive blow led to an enraged Hitler threatening to scrap the surface fleet. Any hope that Raeder had that he could establish a working "Fleet Air Arm" were finally dashed and the Küstenflieger were reduced to a shadow of their previous establishment.

By mid 1943, the air war was going badly for the squadrons based in south west France, with the Ju 88s tasked with protecting U-boat sorties from Allied heavy bomber attacks coming off worst from encounters with RAF fighters. "The depredations of the heavily-armed and manoeuvrable Beaufighters were unsustainable" Paterson states. In March Ulrich Kessler, commanding the air assets in the area, reported to Donitz that he was no longer able to provide protection for U-boats transiting the area. The introduction by the Luftwaffe of the Me 410 (an improved variant of the unsuccessful Me 210) revealed that it was inferior to Allied fighters and it was soon relegated to anti-shipping strikes. Other modernised equipment, including the Ju 188, whilst promising, lacked a powerful engine and did not enter service until mid 1944.

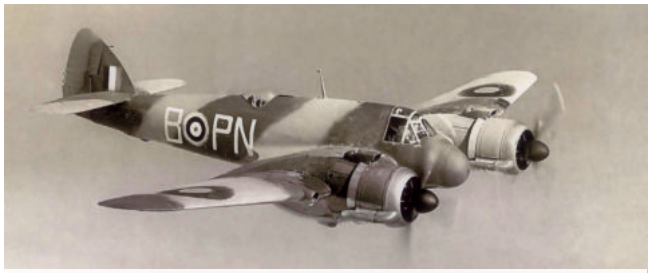
In the Mediterranean, the invasion of Pantellaria had been followed up by the Allies with Operation HUSKY, the invasion of Sicily. Luftwaffe maritime air assets mounted determined attacks on the beachheads, with dive-bombing sorties by Ju 88s carrying the brunt of the offensive; but, as Paterson comments, "the Luftwaffe's response had been fractured and of little concern to the Allies." With defeat in Sicily looming, the German High Command remained convinced that it was a feint and that the real Allied thrust into Europe would be channelled through the Balkans. For this reason, huge reserves of men and material were maintained in the Middle East, leaving Luftwaffe forces in Italy severely weakened.

In a chapter entitled "The Soft Underbelly" (a phrase often attributed to Winston Churchill) Paterson provides detailed anecdotes of the confused fighting in the Aegean. It was during this campaign that the Luftwaffe introduced the Hs 293, a radio controlled unpowered glide bomb, which, together with determined torpedo attacks, had some significant successes against Allied shipping. "For the British," he remarks, "the loss of the Dodecanese was a disaster."

In late 1943, the Luftwaffe made a determined effort to reinvigorate the Atlantic U-boat campaign by introducing the Ju 290 four-engined transport on long-range reconnaissance missions. This aircraft replaced the Fw 200 Condor, which had proved to be structurally inadequate and too slow for continued operations. As with many promising German designs by this stage of the war, there was inadequate resource available to the aircraft industry to provide and support an adequate force. The continuing strain of operations was also steadily reducing the availability of experienced aircrew. Paterson describes in great detail the continuing decline in the effectiveness of the Luftwaffe's maritime forces.

This splendid volume includes a profusion of previously-unpublished photographs, e.g., pictures of *Tirpitz's* Arado aircraft being stored in its on-board hangar. This is a book of great scholarship, packed with anecdote and supported with descriptions of the various aircraft mentioned in the text. A comprehensive bibliography and index are included. Together with its preceding volume on the earlier stages of the War, Lawrence Paterson has produced what must surely be the definitive history of Luftwaffe maritime operations.

Eagles Over the Sea, 1943-45. By Lawrence Paterson. Published by Seaforth, ISBN978 1 5267 7765 2.



Bristol Beaufighter 1C, type 156. © ***Duncan Greenman Collection***

Messerschmitt Me-210A1 Hornisse. © ***Bundesarchiv***

Photo Quiz answers from pages 24 and 25

1 Supermarine Attacker
2 Blackburn Buccaneer S1
3 Vought Corsair
4 Short S27
5 Westland Wessex
6 HP115
7 de Havilland Vampire T22
8 Vought Corsair
9 BAe Harrier GR9A
10 McDonnell Douglas Phantom F4
11 Supermarine Scimitar
12 Supermarine Walrus
13 Blackburn Buccaneer S2B
14 BAC 221
15 Crankcase ventilator 120 HP Green 1914
16 Fairey Swordfish
17 Supermarine Attacker
18 Fairey Fulmar
19 Westland Sea King
20 Sopwith Baby
21 Westland Dragonfly

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