

Chiltern Airwords



50 YEARS AGO

The Boeing 747 first flew on 9th February 1969, registration N7470.

The prototype is now preserved at the Museum of Flight, Seattle.

Photo by Robert Urquhart

**The Chiltern Aviation Society Magazine
January and February 2019**

CHAIRWORDS

With British Airways celebrating its 100th anniversary in August it is quite astonishing to reflect on the progress in aviation since that Airco DH4A took off from Hounslow Heath for Le Bourget, Paris, all those years ago – the world's first international scheduled flight. From the stately HP42s and, later, the magnificent Short Empire flying boats with Imperial Airways, to BOAC in post-war years introducing the Comet 1, the world's first jetliner and BEA's Trident 1C carrying out the first commercial automatic landing with fare-paying passengers – the list goes on, including Concorde of course. In my own service time I've seen Lancastrians in BSAA taking nearly three days to Santiago and Lima in 1946 to Boeing 787s currently operating direct in 14 hours 40 minutes – what next, I wonder? **Keith Hayward.**

EDITORWORDS

Firstly, on behalf of CAS members, a very happy 'Big Birthday' to Keith for 25th February 2019. Also, a big thank you goes to Bob Hickox for his articles on Bomber Command in this issue and his feedback on previous articles, which shows that Airwords is read and enjoyed by at least one person! **David Kennedy.**

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THE CHILTERN AVIATION SOCIETY; Founded in 1968. Associate member of Air Britain Historians Ltd. **President;** Philip Birtles. **Patron;** David F. Ogilvy OBE FRAeS. Please note Airwords is produced purely for CAS members' own private study and enjoyment and it is not for sale. Opinions expressed in Airwords are those of the author and not necessarily those of the CAS Committee.

2019 PROGRAMME;

WED Jan 23rd – Rudolf Hess Story by **Tony Eaton**

WED Feb 27th – Roald Dahl's War by **Sqn Ldr Graham Laurie (Retd)**

WED March 27th – AGM (with photos from **John Roach**)

MEETINGS: Fourth Wednesday of the month (third in December) 8pm to 10 pm at *Ruislip Methodist Church Hall, Ickenham Road, Ruislip, Middx, HA4 7BX*. Plus, our Mid-month Pub Socials, Wednesdays, 8pm *The Coach & Horses Pub, 1 High Rd, Ickenham, Uxbridge UB10 8LJ*. Please contact CAS for exact mid-month date each month.

Down in Bermuda – Another BSAA Story by Keith Hayward

Will 'Hank' Hancock DFC, an ex-RAF Stirling and Mosquito pilot, joined British South American Airways early in 1947 as a co-pilot along with many of his wartime colleagues. After being put through his paces by Captain Rodley, the Senior Training Captain, he operated his first flight as First Officer on 19th March from London Airport to Buenos Aires on York G-AHFF *Star Gleam*. Air Vice Marshal Don Bennett, the Chief Executive, chose not to have specialist navigators as crew members and therefore every pilot was expected to obtain a First-Class Navigator's Certificate within six months of employment. This was quite a challenge but Will achieved this by 1947. He then settled down as a First Officer on Lancastrians and Yorks on the East Coast route to Buenos Aires. Before long he was rostered on the even longer Lancastrian West Coast route to Santiago, Chile. It was on this route that Will was involved as First Officer on Lancastrian G-AGWK *Star Trail* which crash landed at Bermuda in a tropical storm, an incident that has been well recorded. Commanded by Captain Woolcott, G-AGWK took off from the Azores on 4th September and then had to hold off Bermuda for nearly two hours at night during a storm. Eventually, the Captain was cleared to land at Hamilton-Kindley Field and started the approach that was completed in marginal weather conditions and poor visibility. Too low, the four-engine hit a radio mast, stalled and crashed few hundred yards short of runway. All 20 occupants were rescued while the aircraft was written off. The aircraft had been airborne for 11 hours and four minutes. They must have been exhausted and very shaken. Nevertheless, the Bennett 'press on regardless' spirit prevailed, and Will was operating again four days later as First Officer on G-AGWG *Starlight* for 10 hours 37 minutes from South America to the Azores and then, after a one-hour refuelling stop, a further seven hours to London. Fortunately, Bennett's crews were young and at 24 years old, Will Hancock was quite used to gruelling operations with Bomber Command and had stamina.



Left: Avro Tudor Mk.IVB Super Trader similar to G-AHNP *Star Tiger*

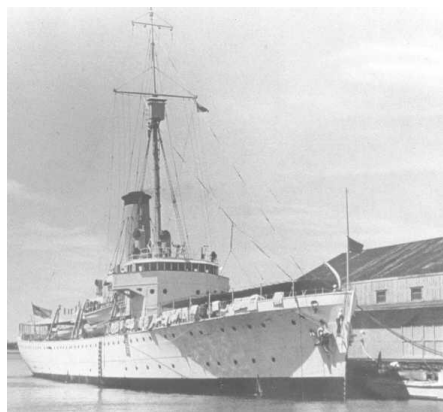
In December 1947, whilst operating as First Officer on the new Lancastrian route to Nassau, with Captain Alabaster, he was suddenly switched to the new Tudor IV G-AHNP *Star Tiger* on the Bermuda to Nassau sector having never flown a Tudor before. On 1st January 1948, he was off again on Tudor IV G-AHNJ *Star Panther* with Captain Hartley, operating the Azores to Bermuda sector. The weather forecast for Bermuda was not good so they flight planned via Gander. So far so good. After take-off from Gander they were advised that Bermuda weather was still not good so they returned to Gander having been airborne for seven hours and one minute. All in a day's work.

In between scheduled flights the First Officers were detailed as duty pilots at London Airport. This work entailed positioning aircraft to and from Langley, BSAA's maintenance base, as well as some test flights. These were long days. On 21st June 1947 Will started his day as duty pilot by air testing Lancastrian G-AGWL *Star Guide* from 06 42GMT to 07 20GMT and ended his day air testing Lancastrian G-AKFG *Star Traveller* from 19 25GMT to 20 40GMT. On 10th October, with Captain Fordham, he flew Tudor IV G-AHNN *Star Leopard* to Avro at Woodford for modifications. Amusingly, in his log book he recorded the destination as Woodley, which was Miles Aircraft small grass airfield in Berkshire! Somehow, I feel that Woodley would have been more than a challenge. The Berlin Airlift in 1949 involved a number of civil British aircraft as well as RAF and USAF participation. The civil airline part of the operation was co-ordinated by BEA. BSAA's five new Tudor Vs were involved and many of the young First Officers were positioned to Wunsdorf for these duties, which involved the carriage of bulk domestic fuel to Berlin. Will Hancock's first stint lasted from 25th March to 16th April on Tudor V G-AKCA *Star Hawk* when 29 sectors were operated and again from 3rd May to 15th May when he operated a further 14 sectors on G-AKCA *Star Hawk* and G-AKCB *Star Kestrel*. Following the merger with BOAC in July 1949, Will Hancock continued flying the South American route, then converting to Argonauts in early 1950 still as a First Officer. He obtained his command with BOAC in February 1959 on Bristol Britannia 312s and later on Vickers VC-10s and finally retired from British Airways in July 1978. Will was another of Bennett's boys who did well after learning the hard way like so many of his colleagues.



The article on the disappearance of Amelia Earhart in the last issue of Airwords, has prompted further feedback from Bob Hickox who has found more information as follows; Regarding the disappearance of Amelia Earhart, it is important to note that at one time she employed the services of Paul Mantz as her technical advisor. Paul Mantz was a stunt flyer in films who planned meticulously for every stunt he carried out, so that nothing would go wrong. However, after Earhart suffered a take-off crash from Honolulu in an overloaded Electra, on her initial attempt to fly westwards around the world, she dismissed Mantz's services, no doubt blaming him for them carrying too much equipment, rather than her lack of experience flying twin-engined aircraft. Consequently, for her new

round the world venture Amelia and Fred Noonan, her navigator, tried to reduce the weight of the Lockheed 10E in minor ways including discarding the trailing aerial which enabled them to ask for bearings on 500 kHz, the frequency on which these were usually taken and transmitted from ground stations. This meant that she could not ask for bearings from ground stations to establish her position. This became crucial as she neared Howland Is, which was her first stop across the Pacific after leaving Lae in Papua New Guinea. The Island was very small measuring two miles long and half a mile wide on which there was an airstrip. However, this was difficult to distinguish from the shadow of clouds over the sea. When carried, the 250 ft trailing aerial had to be wound out and in, which Earhart disliked, and neither she nor Noonan was very good at Morse Code, the only alternative. Mantz was appalled when he heard about this as the trailing aerial was their lifeline if they became lost. The US Coast Guard cutter '*Itasca*' (see photo below) was positioned relatively near Howland Is to take and transmit radio bearings and messages as well as to make smoke to provide a visual signal. For the flight Noonan had to occupy a place at the rear of the aircraft while Amelia was in the cockpit separated by fuel tanks. They could only communicate via notes at the end of a long bamboo pole. A catwalk did enable Noonan to reach the cockpit over the fuel tanks, but he normally sat in the rear, which in retrospect was not a good arrangement, where navigating and piloting need to be in close association and proximity to each other to ensure accuracy on long flights where the destination is a small island in a vast ocean. To cut a long story short, the '*Itasca*' was unable to establish Amelia's position for her as she neared Howland Is. They could hear her transmissions but she was unable to



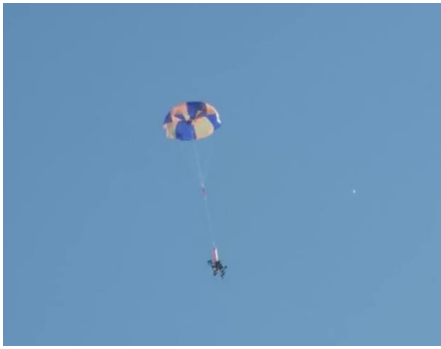
receive a reply because there was no trailing aerial to pick up their transmissions. They could hear her increasingly anxious requests and estimates of her position. Noonan made her fly north and south when he estimated their position to be either north or south of Howland Is at the same degree of longitude. If his calculations of their position were wrong, which they obviously were, then without the help from the '*Itasca*' which they could not hear, they had no more aids to find Howland Is. After her last desperate message, she requested a bearing on 7500 kHz, but this was not a frequency on which bearings could be taken. The '*Itasca*' expected to take bearings on 500 kHz, but did not know that the trailing aerial for this frequency had been removed from the Electra. Amelia was unable to make out any voice transmissions sent to her from the '*Itasca*' and very likely ran out of fuel and was forced to ditch. This would have been a difficult proposition at best and when the sea is rough, as it was in that area at

the time, extremely difficult. It is likely that they ditched unsuccessfully and were both drowned when the aircraft sank. The Pacific is vast and they would have sunk fairly quickly, and the Lockheed would have ended up as a minute speck on the bottom, probably at great depth. No wonder that no trace of them or their aircraft has ever been found.

Postscript - Interestingly, Richard Gillespie, of The International Group for Historic Aircraft Recovery had previously claimed the Lockheed landed on Gardner Is (now Nikumaroro), 400 miles from Howland Is, but in another report he contradicts this by saying '*Itasca*' estimated, by signal strength, that Earhart was 200 miles from the ship's position (off Howland Island) making a ditching 200 miles from any land very likely. In WW2 *Itasca* became HMS Gorleston in 1941 and served as an escort ship for convoys to West Africa (LH).

References; *What did happen to Amelia Earhart?* - Parts One and Two - *Aeroplane Monthly*, Jan and Feb 1989

Drone safety parachutes



People waiting for a flight out of Gatwick last Christmas might not appreciate drones, but when used legally they are very useful tool and certainly not a nuisance. Much has changed over recent years and drones are a far cry from those £19.99 toys on the shelves of nearly every shop. They have now been developed for aerial survey work and surveillance and may be worth many thousands of pounds, especially those which are computer guided and loaded with high resolution digital cameras and CCTV. All that equipment is certainly worth saving but more importantly with the weight of these drones increasing, the aim is to stop the drone and its spinning rotors from tumbling out of the sky on to someone's head or their property! Up till now the problem of attaching a parachute to a drone is that the parachute cords were likely to get tangled up in

any rotors still functioning and just add to the mess. However, a company called Indemnity Inc, in Alaska that had been working in the film industry, set out to fix the problem. The team at Indemnity looked into various solutions, but the parachute seemed too good to pass up. They just had to figure out a way to keep it away from the drone's rotors. So, they decided to use a parachute, but have it release outside the draw of the rotors, by using an inflatable tube that becomes rigid, and by stuffing the parachute inside, they could extend it from the airframe and then launch the parachute. To protect the parachutes lines and keep the attachment point of the parachute outside of the roll radius, the tube would have to extend exceptionally fast. And no material on the market was capable of being inflated fast enough without ripping itself to shreds, so they made one out of Dyneema, a fibre 15 times stronger than steel, and sown together by radio-frequency welding. They could attach the material to itself and the bond was stronger than the material alone. The tube could inflate at 30 psi in 30 milliseconds with a launch velocity of 90 mph, and it'd stay strong. Their system is called Nexus, and has onboard software to tell when the drone is entering a fatal roll and automatically launch the parachute. The operator also has control to launch the parachute if they see the drone headed for trouble, like a building, power line, or tree. The system attaches to any part of the drone that can take the circular clip, in the same way things are attached to a bicycle, so Nexus can launch sideways or upwards, as in the photo (right). As the parachute is attached to a long and strong cord, the actual parachute deploys much higher than the rotors, thus avoiding entanglement. It doesn't prevent owners from flying drones irresponsibly, but at least if they go wrong there is less of a danger of serious injury to an innocent third party. **(LH)**



Shark Head Embraer E190-E2 (ERJ-190-300 STD) PR-ZGQ



To publicise their new E190, Embraer have adorned their aircraft with a very realistic portrayal of the 'sharp end' of a Great White Shark painted round the cockpit, which has caused a lot of excitement in the industry and has certainly given the E190 the publicity that the company desired! The aircraft has been named 'Profit Hunter'. This new aircraft is so attention-grabbing that it's distracted from one its most interesting interior features – it has no middle seats. Brazilian plane manufacturer Embraer has been showing off this new aircraft at various events. The aircraft has been to Farnborough Airshow, Manchester Airport and Dublin on the final leg of its tour, having already visited the US, Africa and China. **(LH)**

Dangerous Moonlight - Bomber Command in the Second World War by Bob Hickox



As the new Commander-in-Chief of Bomber Command from 1942, Air Marshal Harris presided over the rapid expansion of Bomber Command, with the introduction of four engine bombers which became available in much greater numbers at that time. Harris oversaw improved bombing tactics, and the effective use of radar technology. He succeeded in turning what had been a poorly equipped force with mediocre results into an efficient and deadly weapon of war, a situation brought about largely by dint of his personal commitment and strength of character. With the first 1,000-bomber raid in May 1942 on Cologne, scraped together with a mixture of four engine heavies, twin-engine bombers, some from Operational Training Units and even Coastal Command, much of the centre

of that city was destroyed. The defenders were overwhelmed by the scale of the raid which had not occurred previously. With this raid Harris sent out a strong signal to Bomber Command's detractors, particularly in the Royal Navy, that he meant business, and that his Command was not going to be dismembered and its resources shared out between the other two services. Although promoted Marshal of the RAF in 1945, unlike the other main leaders of the war years, Harris did not receive a peerage in the 1946 New Year Honours. Politicians, including Churchill himself, were quick to distance themselves from the bomber offensive, particularly the raid on Dresden, now that the war had been won, and Sir Arthur Harris and Bomber Command became victims of post war political expediency.

For the first three years of war from 1939 to 1942, Bomber Command was made up of twin-engine medium bombers which carried a limited bomb load and which were extremely vulnerable while carrying out daylight bombing. These included the Vickers Wellington, Armstrong Whitworth Whitley, Handley Page Hampden, Bristol Blenheim and later the disastrous Avro Manchester in 1941 (the forerunner of the Lancaster). The best of the bunch was the Wellington, a number of which attacked Wilhelmshaven in daylight in September 1939. However, the majority of them were shot down by German fighters and it was concluded that night bombing was the only sustainable option, but that made the target much more difficult to find and more advanced navigation aids were badly needed.



The Wellington, Whitley and Manchester all had power operated turrets, although the 0.303 machine guns proved less effective against cannon armed Luftwaffe night fighters. The Hampden was fast and manoeuvrable but with hand held Lewis machine guns, was not easily defended from a beam attack. Similarly, the Blenheim at the beginning of the war, had one fixed machine gun for the pilot and just one Lewis in the rear turret.



Above right; A formation of 2 Group Blenheims of 101 Sqn, August 1940, with a single Lewis Gun in the turret. Bottom Left; Hampdens were fast and manoeuvrable but with no guns to protect the sides the pilot was vulnerable to Bf 110 fighters forming up to one side allowing the German rear gunner to fire straight in to the cockpit. Above; Whitleys of 102 Sqn at Driffield early in WW2. Despite having two power operated gun turrets and a good range, the Whitley was too slow and not in the same league as the Lancaster and Halifax.

The Butt Report and the formation of the Pathfinder Force



With the publication of the Butt Report in August 1941, which concluded that, at best only 10% to 20 % of night bombers placed their bombs within 5 miles of their intended target, it was decided that targets should be 'areas' rather than more specific targets, and the area bombing of cities to destroy civilian morale was initiated. In order to make night bombing generally more accurate however, the Pathfinder Force (PFF) came into being on 15th August 1942, with headquarters at Wyton, Huntingdonshire. It was formed at the direct request of the Air Ministry and initially comprised five squadrons, one from each of the operational Bomber Command Groups before becoming No.8 (PFF) Group at the beginning of 1943 equipped with Lancasters and Mosquitoes, the best aircraft for the job.

In 1940, the Germans had employed Kampfgruppe 100 as pathfinders, to precede the main force on each raid, and with the aid of navigational beams (Knickebein, X-Gerät and Y-Gerät) accurately lit up the target area with incendiary fires. These methods had been very successful and ensured the destruction of the old centre of Coventry and its cathedral, heavy damage to other provincial cities and port cities such as Southampton, Plymouth, Portsmouth, Greenock, the port for Glasgow, Manchester and Birmingham, and the blitz on London, where much of the area of the docks and the East End of London was heavily damaged, including much of the City of London. RAF Night fighters at that time were largely ineffective, before airborne interception (AI) radar had been sufficiently developed, so the German night bombers sustained relatively few losses to British night fighters and anti-aircraft fire.

Although Harris was opposed to the formation of the Pathfinders as an elite force within Bomber Command, its necessity outweighed his opposition due to very poor bombing accuracy at the time. It was formed under Group Capt Don C.T. Bennett and its contribution to the war effort was immense, perfecting as it did new techniques for precision Main Force bombing, including "Oboe", blind bombing system and "Gee" radio navigation equipment with which the target could be found more accurately, and brilliant target indicator flares dropped which would indicate the aiming point to the Main Force bombers. Progressively, all Lancasters and Halifaxes were fitted with H2S, a mapping radar which could identify rivers and coastlines through cloud and other landmarks, which was a useful aid to the navigators in the Main Force, particularly when the target was cloud covered. Most crews would have preferred a ventral machine gun turret instead, which was badly needed for combating German night fighter attacks from below.



Once the two engined medium bombers had been relegated to Operational Training Units or sent abroad, Bomber Command then began to rely on the four-engined 'heavies' such as the Lancaster, Halifax and the Stirling. However, the Stirling (*shown left*) had a short 100ft wingspan which enabled it to fit in most RAF hangars, but this gave it a lower ceiling compared to the other two types, where it was in greater danger from flak and searchlights. The earlier Marks of Halifax had the RR Merlin engines but the Halifax B. Mk III was fitted with enlarged tail fins to aid stability and Bristol Hercules air-cooled radial engines,

which were less susceptible to damage by flak or bullets than the water-cooled inline Merlin engines. Halifaxes remained as part of the heavy bomber force until the end of the war with Lancasters. Such was the importance of the Lancaster, that Harris forbade their use in any other Command, unlike the Halifax and Stirling.

Above top left; A 149 Sqn Wellington in 1941 at a time when most of the bombs missed the target. Middle right; A Manchester with its troublesome RR Vulture engines. Bottom Left; Stirling; the 100 ft. wingspan meant a high aspect ratio wing and long undercarriage legs. Bottom right; This Lanc was sent to Canada as a sample aircraft fitted WITH a ventral turret which was not adopted by the RAF!



The Electronics War



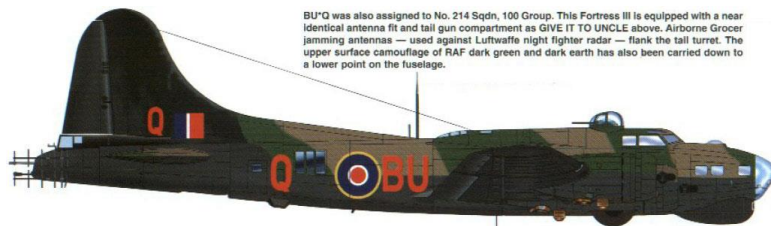
To aid Bomber Command, 100 (Bomber Support) Group was formed as a special duties group. It was formed on 11th November 1943 to consolidate the increasingly complex business of electronic warfare and countermeasures within one organisation. The Group was responsible for the development, operational trial and use of electronic warfare and countermeasures equipment. Various aircraft were used including Defiant, Beaufighter, Mosquito, Lancaster, Halifax, Stirling, Fortress, and Liberator aircraft. All these types were used at various times to either jam German radar, home in on to enemy night fighters and disrupt radio and radar communications. The Group pioneered measures to counter what was a formidable force of radar-equipped Luftwaffe night fighters, utilising a range of electronic 'homers' fitted to DH Mosquito fighters. This detected the

German night fighter's radar and radio emissions and allowed the RAF fighters to home in onto them, either to shoot them down or disrupt their missions against the bomber streams. By the end of 1943, the *Nachtjagd* (Night Fighters) found that the RAF was jamming or disrupting most of its radio frequencies, using airborne devices such as Airborne Cigar (ABC), Airborne Grocer or an extra German speaking crew member to issue fake orders, plus ground-based stations which severely disrupted the night fighters' radio navigation linkages. This often made it more difficult to mass fighters against the bomber stream. Radar jamming became so effective by mid-1944 that the night fighters were forced to use other forms of communication, such as the use of civilian radio broadcasts. Meanwhile other Mosquitoes would patrol around the known Luftwaffe fighter airfields ready to attack any landing night fighters they came across. This constant harassment had a detrimental effect on the morale and confidence of many Luftwaffe crews, and indirectly led to a high proportion of both aircraft and aircrew wastage from crashes as night fighters hurried to land to avoid the Mosquito threat. Such was the success of electronic countermeasures, that during 1944-5, Mosquitoes of 100 Group claimed 258 Luftwaffe aircraft shot down for 70 losses over

GIVE IT TO UNCLE was a Fortress III (ex-B-17G-40-VE) of RAF 100 Group. This Group had several squadrons which operated various aircraft in the Radio Countermeasures (RCM) role. This Fortress III was assigned to No. 214 Squadron and equipped with an undernose H2S radome, an Airborne Cigar communications jamming antenna in the radio compartment, Monica tail warning radar on the vertical fin and below the tail guns and a non-standard tail gunner's compartment.



RAF Interior Grey-Green



BU'Q was also assigned to No. 214 Sqn, 100 Group. This Fortress III is equipped with a near identical antenna fit and tail gun compartment as GIVE IT TO UNCLE above. Airborne Grocer jamming antennas — used against Luftwaffe night fighter radar — flank the tail turret. The upper surface camouflage of RAF dark green and dark earth has also been carried down to a lower point on the fuselage.

Germany. This tactic was also used by the Germans who sent over intruder aircraft to our bomber airfields when they were landing after a raid. A number of bombers were shot down in the UK airfield circuits, the crews of which were then least expecting it. Such attacks were very effective and would have a detrimental effect on bomber crews'

morale. Luckily the Germans did not exploit this tactic very often, otherwise it would have become a very serious issue. Electronic counter measures were never straightforward and sometimes a new piece of equipment gave one side the advantage and then this went the other way, when an effective countermeasure was found. From 1943 Pathfinder heavies were fitted with H2S mapping radar to improve navigation and targeting, but after only its second operational use a set was captured intact by the Luftwaffe. For a period of time in 1943-44 German night fighters could home in on to H2S transmissions, using *FuG 350 Naxox Z*, which helped to locate the bomber stream the and likely target, reducing the RAF's chances of success in a protracted campaign. In addition, the RAF didn't realise that the German signal intercepts were skilled at detecting Bomber Command's habit of testing H2S on the ground prior to a raid, which put the German *Zahme Sau* on alert for an attack. *Zahme Sau* involved night fighters circling a beacon waiting for the bombers to arrive. The Himmelbett system coordinated ground-based radars with its night fighters in a grid from 1942 onwards. But this system was a static defence and vulnerable if its Command and Control was disrupted. As a Lancaster could pass through it in less than four minutes, the grid system could be easily overwhelmed. Therefore, Harris introduced a dense bomber stream in May 1943 which channeled all bombers through a few boxes and into a tighter formation which overwhelmed the handful of fighters in their path with too many targets. The Luftwaffe night fighters then shifted to more decentralised operational methods which enabled them to free hunt within the bomber stream, especially when the Himmelbett system was overwhelmed.



Above left; Mosquito F for Freddie of 105 Sqn completed an incredible 213 operational missions. Middle; Two Boeing Fortress aircraft of 214 Sqn used by 100 Group, equipped with Airborne Cigar and 'Airborne Grocer' to listen in to and jam German fighter direction. Bottom right; A Handley Page Halifax Mk VII with H2S under the fuselage.

The Luftwaffe Night Fighter threat continues

The decentralised operational method used by the Luftwaffe in 1943-44, was assisted by single-engined 'Wilde Sau' (Wild Boar) day fighters acting as night fighters. Some but not all were equipped with airborne radar, as it was considered that they could be used en masse to inflict disastrous losses on the bomber stream, picking out their targets visually from above against the lighter background from fires from cities below, or guided by searchlights to the bomber stream. Even those single seaters (such as Fw 190 photo right) fitted with radar gave competent pilots too much to do! Their success was limited and there were many accidents due to the lack of training of day fighter pilots in night flying. Due to these factors their contribution to bomber losses combined with their accident rate did not make their losses worthwhile, and their use was discontinued in 1944.



In the first six months of 1944, when German night fighters were equipped with the new SN-2 target acquisition radar (See Bf 110 photo left) and 'Schrage Musik', upwardly inclined 20 mm cannons for attacks from below, and many Lancasters lost on operational sorties fell victim to this. The RAF's failure to learn about the capabilities of the SN-2 radar and 'Schrage Musik' for more than 8 months after the German night fighters started using them, left the Lancaster crews virtually defenceless during the most intense phase of the bombing of Germany, especially during a series of attacks on Berlin.

Stirling losses were so heavy during the Battle of Berlin due to their limited ceiling that they were retired from operations, plus the older Halifaxes. The Stirling was therefore taken out of Bomber Command Main Force frontline service by the beginning of 1944 and relegated to specialist ECM roles or use by 38 Group for glider towing in support of the Airborne Forces.



In the attacks on Berlin, Harris failed to achieve his objectives. German civilian morale did not break. The city's defences and essential services were maintained and war production in greater Berlin did not fall. Area bombing consistently failed to meet its stated objective, which was to win the war by bombing Germany until its economy and civilian morale collapsed. The bombing had kept a check on German production and caused the direction of resources from offensive to defensive purposes. In 16 raids with 9,111 sorties on Berlin, Bomber Command lost 492 aircraft, with their crews killed or captured, and 954 aircraft damaged, a rate of loss of 5.8%, exceeding the 5% threshold that was considered the maximum sustainable operational loss rate by the RAF. Over the course of the war, Bomber Command suffered a casualty rate of more than 61% amongst its aircrew, with 44% being killed. A very high rate of loss.



The civilian death toll on the ground in Berlin was approximately 10,305 casualties, a fraction of those killed in the Hamburg raids earlier in 1943, when over 40,000 people were killed in one raid due to a firestorm which affected the centre of Hamburg. This was caused by the coalescence of large fires which consumed oxygen at a rapid rate that caused high winds to blow into the fires. This left carbon monoxide which caused the deaths of many in the shelters who were unaware of its deadly presence. The initial use of "window", metal strips cut to the same wavelength as the German radars and dropped by the Lancasters, confused the German radars to such an extent that the defending fighters were sent in the wrong direction and there was no opposition to the raid. Unfortunately, once the Germans realised what

was happening they were able to use a different wavelength to enable their radars to see through "window". As a result, these devastating raids on such a scale could not be repeated against other German cities.

If these raids had been repeated, Albert Speer, the German Minister for Production, indicated that such destruction of 4 or 5 other cities would have brought a rapid end to the war.

To combat the threat of German night fighter attacks, the RAF introduced 'Monica' which was a range-only tail warning radar for bombers, however in some situations it provided too many false returns from other bombers for it to be useful. Once the Germans were aware of 'Monica' after examining examples from crashed Lancasters, they soon created the *FuG 227 Flensburg* passive warning receiver which could home in on 'Monica'. Harris recognized that the *Nachtjagd* was growing stronger and that bomber casualty rates would soon reach an unsustainable level. The equipping of a large number of Lancasters with H2S ground mapping radar in the dorsal position under the fuselage both robbed the ability of the Lancasters to have a defensive gun position below and helped the German night fighters to find the bombers stream from a considerable distance via *FuG 350 Naxos* Z detector in late 1943 which homed onto the H2S radar emissions. The introduction of the Lichtenstein SN-2 radar to find targets in 1943 was also a significant electronic advance for the German night fighters. Harris recognized the tactical success of the German night fighters when he said on 7 April 1944:

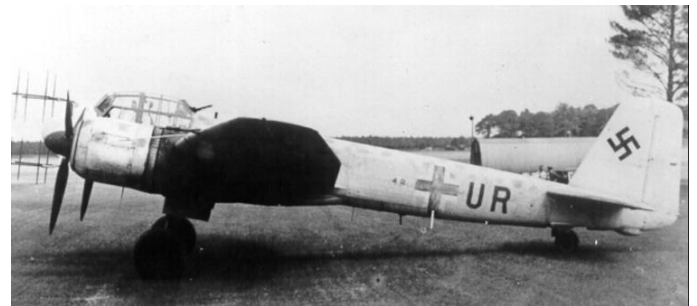
"The strength of the German defences would in time reach a point at which night bombing attacks by existing methods and types of heavy bomber would involve percentage casualty rates which could not in the long run be sustained. We have not yet reached that point, but tactical innovations which have so far postponed it are now practically exhausted."

These high losses were the logical result of a bomber aircraft 'weapons system' that was designed around a single characteristic, bomb load. But it was not enough for the 'heavies' to reach Berlin with a large bomb load. They needed to survive and fly multiple missions in order to justify their cost of construction. It was undermined by a failure to make realistic operational assessments in the critical early days of the Lancaster and Halifax design program. Not enough effort was put into defensive measures

in a night flying role and night navigation until failure became a very real possibility. Tactically the Messerschmitt Bf 110 with the SN-2 radar and 'Schrage Musik' and other twin-engined night fighters such as the Junkers Ju 88 routinely decimated Lancaster raids at an exchange rate that Bomber Command could not afford. In the first 6 months of 1944 a total of 1,041 Lancasters were lost on operational sorties. This was equivalent to a loss of 70% of all Lancasters built in this same period. When Lancasters lost in accidents and non-combat losses are included, the loss rate was equivalent to 94% of Lancasters built in the first half of 1944. A sustained loss rate of 3.3% meant that no Lancaster aircrews would survive a 25-mission tour. Loss rates only exceeded this in 6 out of 12 months in 1942 and 1943. Harris believed he could break the morale of the Germans with a series of destructive raids on Berlin and wanted the USAAF to join in (which the US vetoed) preferring to target industrial and oil targets. Despite the devastation they caused, these raids were very costly to Bomber Command beginning in August 1943 with 18 more raids over the next six months. Harris' mistake in the Battle of Berlin was in failing to realise that the 'Nachtjagd' was no longer tied to Himmelbett boxes. It was more effective to let the twin-engine night fighters pursue a free hunt using their airborne interception radar as an important aid to finding a target. Harris did not realise this until later in the war, so that losses from his closely packed bomber streams were much higher than expected. Meanwhile NJG 5 defending Berlin suffered only fourteen Bf 110 combat losses and another twelve in accidents, about one third its strength. Luckily for the RAF, in its quest to stay ahead in electronic countermeasures, it was handed a great prize on 13th July 1944, when a Ju 88G-1, of 7 *Staffel*/NJG 2, flew the wrong way on a landing beacon and landed at RAF Woodbridge by accident (see photo above right). The crew were arrested before they could destroy their equipment, providing the British researchers with the latest version of the Lichtenstein SN-2 VHF-band radar, the *Flensburg* radar detector, and the *FuG 25a Erstling* IFF gear. Interrogation of the crew revealed that the *Flensburg* system detected an RAF bomber's *Monica* tail warning radar emissions, and that it was used as a homing system. *Naxos* was not fitted, and the crew stated that it was only used for initial warning, not as a homing system. This was of great relief of everyone involved; *Monica* was already being replaced by *Fishpond* systems on most aircraft, and any still equipped with *Monica* was told to turn it off. While H2S remained in use (and retired in 1982!) the Luftwaffe didn't progress very well with centimetric radar and so their night fighters continued, almost to the very end, with antler type radar aerials that increased drag, often iced up and slowed them up considerably.



A captured Me-262B-1a/VI Night Fighter; luckily for the RAF only a handful became operational in late 1944.



After the considerable losses from the attacks on Berlin, the RAF night bomber force was diverted, against Harris intense opposition, to attacks in support of D-Day on transportation depots and railway junctions in France and elsewhere to disrupt communications with the Normandy coast. Known gun positions and other defensive measures were bombed in preparation for Operation Overlord in June 1944. With certain exceptions, such as the raid on the Panzer Training School at Mailly-le-Camp and the bombing of Wesseling in the Ruhr, these targets in France were generally less well defended and the Bomber Force was able to recover from its rough treatment over Berlin. At Mailly-le-Camp interference from an US radio station in England prevented communications between the Master Bomber and the Main Force causing much confusion of which the night fighters took advantage shooting down 42 bombers, a loss rate of 11.6%.



The Mosquito on the other hand could bomb Berlin with relative impunity. While its bomb load was inferior to the Lancaster, its high speed made it almost invulnerable to Germany's night fighter and other defences. The Light Night Bomber Force, based upon the Mosquito, was the model for successful strategic night bombing. But Harris would not allow any reduction in his monthly bomb tonnage delivery statistics and would not allow the Mosquito to supplant the Lancaster. While the Mosquito was not capable of carrying a 22,000 Grand Slam bomb, it marked the beginning of the end for slow heavy bombers crewed by seven or eight aircrew. Bomber Command lost 8,325 aircraft in WW2. If every Bomber Command aircraft lost was crewed by just two men, deaths would have been much less than 55,573.

Only the declining strategic position of the German military, Hitler's interference and the failure to prioritise night fighter production prevented the *Nachtjagd* from demolishing the Main Force bombers. Increasingly from 1943 onwards, Luftwaffe fuel shortages due to the destruction of the oil refineries at Ploesti in Romania and the synthetic oil plants by the 8th USAAF daylight bombing raids, contributed to a lack of new, well-trained pilots together with the gradual loss of the '*Experten*' the ace pilots from the Battle of Britain and Russian Front.

Problems with the introduction of faster and improved dedicated night fighters like the Heinkel He 219 (see picture right) caused delays until the last few months of the war, so they were never produced in quantity, causing a decline in the effectiveness of the *Nachtjagd*. Also, a muddled German production programme, political interference, Allied bombing, and the wasting of resources on too many projects in general, added to this decline. The Luftwaffe might have posed a greater threat to the British night bombing policy, particularly with the introduction of new night fighters such as the Heinkel He 219 and Me 262 night-fighter. General Kammhuber, head of the night fighter force, stated that with 18 wings of aircraft instead of only 6, he could have forced the RAF to curtail or change their heavy bombing policy. The He-219 was fast, manoeuvrable, and carried devastating firepower. It was the only piston-engined Luftwaffe night fighter which could meet the Mosquito on equal terms. Advanced features included remote-controlled gun turrets, a pressurized cabin, the first steerable nose wheel on an operational German aircraft, and the world's first ejection seats on an operational aircraft. Despite the decline in the Luftwaffe, night fighter aces like Heinz-Wolfgang Schnauffer shot down seven Lancasters in 19 minutes in February 1945 and only broke off the action due to exhausted ammunition. His final three victories came in March 1945. However, Bomber Command's electronic warfare had been improving and by early 1945, it was able to jam the SN-2 radar, and once the Allies crossed the Rhine air attacks on Luftwaffe airfield were merciless.



Both the Junkers Ju 88 and Messerschmitt Bf 110, although designed originally for other roles, became extremely effective night fighters. Originally designed as a heavy fighter, the Bf.110 was outclassed by the Spitfires and Hurricanes in the Battle of Britain and had to be withdrawn from that battle. The Ju 88, whilst being one of the most effective medium bombers of the Luftwaffe, became also an extremely successful night fighter. Both aircraft were heavily armed with cannon and had a long range and therefore more time in the air to shoot down bombers than single-engined fighters. However, *General der Jagdflieger* Adolf Galland, said that the combination of the Pathfinders' operations, the activities of No. 100 Group, the British advantage in radar, jamming and dropping of *Window*, combined with intelligent attacking tactics, as well as the discipline and bravery of the RAF crews, had been remarkable. He had severe problems in trying to defend Germany in the air at night.

Conclusion



on the home front, which could otherwise have been employed usefully on the fighting fronts. In particular, the 88 mm anti-aircraft gun was also a very efficient tank destroyer. So, the loss of them at the war fronts helped all the allied forces on both fronts. In fact, the anti-aircraft gunners and other defenders were mostly teenagers in the later years of the war due to a shortage of adult personnel.

Allied bombing of German cities killed between 305,000 and 635,000 civilians (including foreign workers). One of the most controversial aspects of Bomber Command during World War II was the area bombing of cities. Until 1942 navigational technology did not allow for any more precise targeting than at best a district of a town or city by night bombing. All large German cities contained important industrial districts and so were considered legitimate targets by the allies. A Bomber Command crew member had a worse chance of survival than an infantry officer in World War I.



A Lancaster Mk II fitted with Bristol Hercules engines in case RR Merlins were ever in short supply.

Controversially, more personnel were killed serving in Bomber Command than in the Blitz, or the bombings of Hamburg or Dresden. Regarding Dresden, one of the biggest myths of WW2 is the often-quoted figure of civilian deaths being anything between 200,000 and 250,000. This is the result of Goebbels taking the true figure of 25,000 and adding a naught at the end in March 1945. In postwar years these fake statistics have been trotted out so often to discredit Bomber Command and to a lesser extent the 8th USAAF that it is almost impossible for the real figures to become known. There's nothing like the truth getting in the way of a good story! Although 25,000 civilian deaths is still a high number, as Bomber Harris said earlier in the war;

"The Nazis entered this war under the rather childish delusion that they were going to bomb everyone else, and nobody was going to bomb them. At Rotterdam, London, Warsaw and half a hundred other places, they put their rather naive theory into operation. They sowed the wind, and now they are going to reap the whirlwind."

By comparison, the US Eighth Army Air Force, which flew daylight raids over Europe from 1942 onwards, had 350,000 aircrew during the war and suffered 26,000 killed and 23,000 POWs. In Bomber Command, statistically there was little prospect of surviving a tour of 30 operations and by 1943, only one in six expected to survive their first tour and one in forty would survive their second tour, if they undertook one. The aim of the bombing offensive, to break the morale of the German civilians, must be considered a failure. The scale and intensity of the offensive was an appalling trial to the German people and the Hamburg attacks in particular were a profound shock to the Nazi leadership. However, on balance, the indiscriminate nature of the bombing and the heavy civilian casualties and damage stiffened German resistance to fight to the end. The Blitz on British cities in 1940 and 1941 had the same effect. But by the time of the "Baby Blitz" in 1944, German bomber capability was much reduced and the British night fighters with their improved airborne radar were much more effective, so that the destruction on the ground was minimal compared to the Blitz of 1940/41.



In the middle war period, for every 100 aircrew in Bomber Command who started their tour, only 16 would remain with their squadron alive and un-wounded at the end of thirty missions. Of the others, 25 would be POWs, 5 would be wounded and the remaining 54 dead or missing. Despite these tragic losses, comradeship remained strong. There would be an indomitable spirit and a high level of morale amongst aircrew, 21 of whom won the Victoria Cross. The small numbers of aircrew who could not function properly due to fear overcoming their commitment to duty had to be taken off operations quickly, as the survival of the crew depended on each member doing their job to the best of their ability. If this was compromised in any way, they were at a much higher risk of being shot down. Those who took themselves off operations recognizing this in themselves were perhaps braver than those who did not, due to the general opprobrium they might suffer. A US survey of their bombing results was not concerned with the RAF area bombing campaign. It pointed to the great success of the USAAF's attacks on Germany's synthetic oil plants starting in the spring of 1944. This had a crippling effect on German transportation. It also prevented the Luftwaffe from flying to anything like the order of battle that the aviation engine plants, parts and sub-assembly fabrication, and final assembly manufacturing facilities would have permitted, and Luftwaffe training and logistics could have otherwise sustained. Further, in going for targets they knew the Germans must defend, the new American longer-range escort fighters, such as the North American P-51 Mustang, were able to inflict crippling losses on the Luftwaffe's fighter force, although ground attack against airfields on the way home could be very dangerous due to concentrated anti-aircraft fire. However, it should be pointed out that later in the war the RAF also made a great contribution to the oil offensive, as its abilities to attack precision targets had greatly improved since the arrival of new navigation and target finding equipment.



Those serving in Bomber Command were not awarded a Campaign Medal though an unofficial medal called the *Bomber Command Commemorative Medal* was launched by Lady Harris and the late Air Vice Marshal Don C.T. Bennett, in April 1985. It was nevertheless taken up by several thousand Bomber Command veterans, and their next of kin. The ribbon colours of blue grey, midnight blue and flame represent the North Sea, the night sky over enemy territory, the flame of the target and the return trip. Sadly, every UK Government since WW2 has declined to issue an official medal. Even the Bomber Command Memorial that was finally dedicated in Green Park, Central London on 28th June 2012 was designed and created privately, with funding coming from donations made by the public, as well as substantial amounts from Lord Ashcroft and businessmen John Caudwell and Richard Desmond. Robin Gibb, the Bee Gees singer, became a key figure behind the appeal, working alongside Jim Dooley to raise funds and have the memorial built. Although many veterans attended the opening ceremony, the great majority of combatants who survived the war, had died of natural causes by then, so that recognition for their bravery and sacrifice was too late for most of them.

Group Captain Leonard Cheshire VC summed it up well, thus:

“If when the bomber offensive and the whole war is analysed, it is decided we had lifted the lid on Fortress Europe just enough to let the Allied armies in, then by God that was enough. And that is what we did do. The bomber offensive was absolutely necessary and we could never have won without it. I think people are beginning to come around to the idea that perhaps we did have to do what we did.”

This seems to me to be an understatement. Without RAF night bombing and the American's day bombing, all the military resources used by the Germans in defence of the homeland could have been more usefully used elsewhere, with serious consequences for the Soviets on the Russian Front, and the Allied invasion of Europe perhaps not happening at all or being launched prematurely with dire results, in an effort to come to the aid of the hard-pressed Soviets. Apart from those flying from this country, there were bomber aircrew who also served in the Middle East, North Africa, Malta, and Italy and the Far East, but as Bomber Command was strictly a *UK based* Command none of them would ever be entitled to a Bomber Command Campaign Medal if one was issued to veterans. Overseas aircrews also need recognition such as those who carried out bombing and torpedo attacks on shipping in the Mediterranean, supplying Rommel's Afrika Korps, as they were instrumental in limiting his essential supplies of fuel and armaments at the end of a long supply line. Thus, Rommel's Panzers ran so short of fuel and that they were unable make further attacks at El Alamein, losing the initiative and the battle. From there, Rommel retreated to the Mareth Line and Tunisia and, after one or two notable successes against inexperienced American attacks, was forced into a wholesale surrender in Tunisia. The Afrika Korps was therefore defeated and more Axis prisoners being taken by the Allies than the number of German prisoners taken at Stalingrad. Few of the Germans escaped to fight another day, though Rommel was a notable exception.

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Armistice Air Power – the RAF, as of November 1918 by David Kennedy.

James J. Halley produced an epic work called *The Squadrons of the Royal Air Force & Commonwealth, 1918-1988*. About the size and weight of a Bible, it truly is a Bible if your interests lie in Military-operated aeroplanes from the early days (pre-1914 equipment is briefly mentioned, albeit often as ‘miscellaneous types...’) with less than 600 pages to play with details are of necessity brief but Squadron badge & motto, locations and equipment are supplied. It would be wonderful if another Air-Britain specialist could do a follow-up ‘1989 to 2019’ edition! Using his data, I’ve covered the types in use October/November 1918. It’s notable how much reconnaissance was occurring –look at all the RE8 ‘Harry Tate’ biplanes. Some squadrons were still working up and the Armistice led to some being disbanded. Increasingly ground attack became common in the last months of the war. Some squadrons relocated to form part of the Allied Occupation Force. As will be seen not every Squadron was based on the Western front;

Sqn no	Type(s)	Remarks
1	SE5a	Used until Mar 1919, reformed with Snipes the following year
2	Armstrong Whitworth F.K.8	Used to Feb 1919, reformed Bristol Fighters Feb 1920
3	Sopwith Camel	From Sept 1917 to Feb 1919
4	RE8	From May 1918 to Sept 1919
5	RE8	From May 1917 to Sept 1919
6	RE8	From May 1917 to July 1920, based in Iraq from April 1919
7	RE8	From July 1917 to Dec 1919
8	F.K.8	From August 1917 to Dec 1918 (succeeded by Bristol F.2b)
9	RE8	From May 1917 to May 1919
	Bristol F.2b	Some in service ‘working-up’ but not fully equipped until 1919
10	F.K.8	From Sept 1917 to Jan 1919
	Bristol F.2b	June 1918 to Oct 1918 (so technically not on Armistice day, some were likely about though)
	RE8	From Oct 1918 to Jan 1919
11	Bristol F.2b	From Jun 1917 to Sept 1919
12	RE8	From Aug 1917 to July 1919
	Bristol F.2b	From March 1918 to July 1922
13	RE8	From April 1917 to March 1919
14	RE8	From Nov 1917 to Nov 1918, latterly in Egypt & Greece
15	RE8	From June 1917 to Dec 1919
16	RE8	From May 1917 to Feb 1919
17	F.K.8	Arrived Egypt Dec 1918 later based in Macedonia. FK8 from March to Dec 1918, when replaced by DH9 & Sopwith Camels
18	DH4	May 1917 to Oct 1918, (Sqn formed Northolt 11 May 1915)
	DH9A	From Oct 1918 to Sept 1919
19	Sopwith Dolphin	From Jan 1918 to Feb 1919
20	Bristol F.2b	From Aug 1917 to March 1932 when replaced by Wapitis, Sqn had left for India 30 May 1919
21	RE8	From Feb 1917 to Feb 1919
22	Bristol F.2b	From Jul 1917 to Dec 1919
23	Dolphin	From March 1918 to March 1919
24	SE5a	From Dec 1917 to Jan 1919
25	DH4	From June 1917 to Dec 1919
	DH9A	From Nov 1918 to Sept 1919, reformed with Sopwith Snipes Feb 1920
26	Nil	Disbanded after returning from Cape Town July 1918
27	DH4	From Sept 1917 to Nov 1918
	DH9	From May 1918 to May 1919
28	Sopwith Camel	From Sept 1917 to Feb 1919, north-east Italian front
29	SE5a	From April 1918 to Aug 1919
30	Martinsyde G.100	Based in Iraq at the time, officially G.100’s in use from Dec 18
31	Be 2c and Be 2e	Based on the NW Frontier area, India
32	SE5a	From Dec 1917 to March 1919. At Northolt since Feb ’69 now there as No 32(TR) Squadron – the currant Royal Flight
33	Avro 504K	From Aug 1918 to June 1919

34	RE8	From Jan 1917 to May 1919
35	F.K.8	From Jan 1917 to March 1919
	Bristol F.2b	From Oct 1918 to March 1919
36	Bristol F.2b	From April 1918 to June 1919, home defence
37	SE5a	From May to Oct 1918, home defence
	Sopwith Camel	From Oct 1918 to July 1919, home defence
38	F.E.2b	From Sept 1916 to Jan 1919, initially home defence but later Western Front, intended re-equipment with HP O/400's never took place
39	Bristol F.2b	From Sept 1917 to Nov 1918, home defence then W. Front - five days before Armistice
40	SE5a	From Oct 1917 to June 1919
41	SE5a	From Nov 1917 to Jan 1919
42	RE8	From April 1917 to Feb 1919
43	Sopwith Camel	From Sept 1917 to Oct 1918
	Sopwith Snipe	From Aug 1918 to Sept 1919 (& later), famous as the Gamecock Squadron. It's their badge, they flew Gloster Gamecocks in the mid-1920's
44	Sopwith Camel	From Aug 1917 to Dec 1919, home defence for London area
45	Sopwith Camel	July 1917 to Jan 1919, Independent AF escort for their bombers
	Sopwith Snipe	From Nov 1918 to Jan 1919 (IAF escort duties)
46	Sopwith Camel	From Nov 1917 to Feb 1919
47	F.K.8	From Feb 1917 to June 1919, based Macedonia
	DH9	From Aug 1918 to Oct 1919
		Earlier in 1918 had used various types including Bristol M.1c monoplane
48	Bristol F.2b	From March 1917 to Feb 1929
49	DH9	From April 1918 to July 1919
50	Sopwith Camel	From May to Nov 1918
	SE5a	From Nov 1918 to June 1919

To be continued...

The Great War in Plastic, Part One – the Original Great Firms - by David Kennedy.

No this isn't about the ongoing scourge of plastic dumped in the World's oceans as highlighted by the excellent nature documentary series Blue Planet 2. It's about the depiction of the (mostly) fighter and bomber types utilised in the 1914-18 war in injection-moulded kit form. To cut down on what could become a lengthy opus I've decided to only cover 1/72 aeroplanes which rules out a series of impressive 1/48 kits made way back in the 1960s or 70s by US firm Aurora. Revell (a US firm but which had divisions in the UK and Germany) built some 'giant'-scale kits of WW1 (and later) warplanes, they too are outside the scope of this article which should still, I reckon, run to a two-parter. I recall, dimly that cereal manufacturers used to sometimes include tiny models in their packs – were any of these WW1 types (probably 1/144 scale)? I've a couple of larger models from this source, ones you had to send off for, thus I bizarrely own a small-scale Lockheed SR-71 Blackbird – and a North Sea oil rig in kit form.

Personal stuff. My father encouraged me to read Biggles books (I suspect many members may have kindled an aeronautical interest in this way). Talk of Sopwith Camels duelling with 'Hun' Albatross and Fokker types was stirring stuff. Thus, perversely perhaps some of the first kits in my house (some built by Dad) were WW1 types with struts and things, hard work compared to a fairly basic Airfix Spitfire or Hurricane. Mind you in my early kit-bashing days the necessity for using all the supplied parts wasn't always appreciated. Thus, a plane might have the top wing glued directly onto the fuselage top and paint, if any was any-old shade will do. I like to think my standards soon improved. Even older-period types were fostered after watching (first time around) Those Magnificent Men in their Flying Machines. A series of 1/48 Edwardian types appeared (under various brand names).

A is for Airfix. Appropriate to begin here, not just for alphabetical reasons but whilst early on in life I got a number of US Aurora kits from a market stall (long gone) in Uxbridge. These were modernish US military and civil types. All were 'Scale fits the standard-size box', a failing also applicable to Revell kits of the era – no two were in the same scale! But as the types were often not available in any other form (bar carving out of balsa) you had to take it or leave it – anyway again these were not WW1 subjects so I shall move on. Believe it or not Airfix dates from 1939 when Hungarian Jew,

Nicholas Kove formed a firm to make air-filled rubber dolls and mattresses. He seemed to like names end in in -ix, and by having a company registered with a name beginning 'A', he knew it would appear at the front of any trade catalogue. In more recent years firms choose numbers, as they come before the A's in such listings 'be they on-line or in print'. Kove was indeed fortunate to have got away from Hungary which sided with the Germans during WW2. When the Japanese joined the Axis and occupied Malaya, Kove saw his supplies of latex disappear. A resourceful man he thus turned to making cheap cigarette lighters and plastic combs. The latter saw him import the first injection moulding machine to the UK. It has been suggested Airfix played an important part in the preparations for D-Day, as their expertise in air filled products led to his firm making inflatable tanks, trucks and aircraft that were used to create vast Armies in Kent, to fool the Germans in to believing the Allies would land at Calais. By 1947 he fell ill and was hospitalised. He used his time creatively and on release created a small promotional model of the Ferguson tractor in 1948. To save costs they were sold as kits not as completed models and to further save money the raw material was dead Biro ballpoint pens, he bought second-hand. (Biro were at the time associated with the Miles aircraft company –but that's another story!)

New people with kit-producing experience were recruited and a new kit The Golden Hind sailing ship emerged in 1952. A dispute over what Woolworth's were prepared to charge led to the use of a cheap bag as a container for the kit bits. Not until 1953 was the first aeroplane produced a (very crude) Spitfire Mk 1. This was replaced by a better, but still simplistic Spitfire IX (each wing and tailplane for example was a single piece of plastic).

1956 saw the first Great War warplane a Bristol fighter –each strut was separate and I found it rather hard work, indeed I suspect I junked it (but have a later version still in the box) – see list. 1958 saw the first 'big' kits the Lancaster and Wellington (Both would eventually be reworked with new moulds). Trains, ships, military vehicles, historic figures and dinosaurs would be later forays into diversification – to name but only some. Airfix were keen to educate the youth hence their choice of aeroplane types but would produce some oddities (even a few fictional ones).

Airfix 1914-18 Fleet. The HP O/400 was magnificent and could be displayed alongside an Airfix Halifax.

Year introduced	Type	Remarks
1956	Bristol Fighter	WW1 colours, much later offered in box in 1920's silver RAF c/s
1957	Fokker Dr1	Red plastic as it was one of 'The Red Baron's' machines
	Sopwith Camel	Rather crude, art shows it lining up on a Zeppelin
	Albatross D.Va	
	RE8	Really nice kit of the 'Harry Tate'
1965	Roland CII	Only 2 wing struts, prob simplest of these to build.
1967	Avro 504K	Australian Sqn, much later offered in box in 1920's silver c/s
	Spad VII	French ace's machine
	Hannover CLIII	Unusual 2-seater with a biplane tail & tricky lozenge paint job. I built mine in a simpler grey/purple camouflage
	WW One Tank	Yes I Know it wasn't an aeroplane!
	DH4	Another gorgeous kit, I converted a second as a VIP DH9A
1968	HP O/400	Includes large bomb inscribed With a Little Hel(l)p from the RAF
1974	Sopwith Pup	By now Series 1 came in card container with clear plastic blister. This is a delightful kit, made mine as a RNAS example but currently dismantled. Kit had a RFC & a RNAS alternative
1984	HP O/400	As per my list –this may be incorrect – see above?

Dogfight Doubles was a concept to pair two existing kits. The stands being such that they might be displayed in close combat. The Bristol Fighter & Triplane, Camel & Albatross and the RE8 & Roland thus appeared (as well as WW2 & later duos). These were not listed in my source but were probably first released in late 1960's I think.

Bag & Box Art. The first bagged kits, including Series 2 subjects like the Anson I, had a simple coloured drawing but this was replaced with a proper painting. These miniature artworks were sometimes attributable to a particular artist. Often planes would be on fire with tracer bullets and bombs flying all around. Then in later years the 'PC-Brigade' decreed that it mustn't be seen warplanes might actually be engaged in violence. Such paintings were doctored to remove some of the content but then a step further was decreed, the box must show a made-up version of the actual kit. I believe it was also suggested that the kit not be constructed by an expert less it might discourage little Johnnie from attempting the kit-building hobby. Sorry to sound sexist but most Airfix kits were aimed at boys, models deemed of more feminine or neutral subjects (eg garden birds), struggled for sales.

Special Editions, later (1980's?) several WW1 models were repackaged as a different colour-schemed a/c and a portrait of the airmen and their potted history appeared on the box. The kit itself was the same.

Decline. I was saddened to see in the 2005 Airfix catalogue (my most recent) that NO 1914-18 types remain bar the Avro 504K, decal options are the WW1 coloured example in the RAF Museum or the 1920's silver Egypt-based a/c. The only other biplanes are a Bulldog, with optional Swedish colours & the Tiger Moth.

FROG. (& Novo). Produced no WW1 types but their Trail Blazers series included Bleriot's cross-Channel monoplane and Alcock & Browns Vickers Vimy. Both could-in theory be reworked into standard military versions (When Russian firm Novo released the Vimy the mould had been changed to conventional bomber and a European coloured RAF example and a silver overseas 1920's example were options. Sadly, the plastic was brittle and the transfers disintegrated on contact with water!) Still Novo did allow me to buy cheaply a lot of types long deleted from Frog catalogues and not likely to be made by anyone else.

Matchbox (Lesney). Also produced no WW1 types but as with other firms here-mentioned some great interwar types such as the Fury, Siskin, Fairey Seafox, Stranraer, Wellesley and HP Heyford.

Revell. Hailing from Venice, California in the USA this was a mighty brand. It seems to date from 1950/51 as a maker of toy cars, prior to this, models were wooden but not branded Revell. The 2 men behind it were Sol Kramer and Lou Glaser, both born in 1917. Not until 1953 (approx.) did their first aeroplane appear. A quite large if crude Lockheed F-94 Starfire. Not until 1962 did an important change within Revell take place. They decided on a common scale of 1/72 for a large range of WW2 aeroplanes beginning with a B-17 'Memphis Belle'. Then some WW1 subjects were chosen, plus interwar type no one else touched. They rarely copied Airfix but when they did produce the same type it might be subtly different –EG their Albatross was a Mark D.III, subtly different to Airfix's D.Va. Their 1/72 fleet was as follows. Mouldings were done in England as it was cheaper but this did sometime lead to inaccuracies. Revell were by no-means the only firm guilty of this I should add.

Type	Year introduced	Remarks
Albatross D.III	1963	All red Richthofen machine, box has it passing a Zeppelin
DH.2	1966	A pusher single-seat fighter, Lanoë Hawker c/s?
Fokker Dr1	1966	Werner Voss colours
Fokker D.VII	1964	Goring's all-white aircraft, an easy option as white plastic
Fokker E.III	1965	
Morane Saulnier N	1965	Imperial Russian c/s
Nieuport 17c	1964	French marks
Nieuport 28	1967	US Squadron I believe
SE5a	1964	
Sopwith Camel	1963	Roy Brown c/s
Sopwith Triplane	1966	RNAS Squadron I think
Spad XIII	1963	Rickenbacker c/s

Some were later offered for sale in sets. I recall Mother and I journeying to Finchley Road every so often as well as lunch and a shop at department store John Barnes (I think) a trip was made to a showroom for Green Shield stamps for a book or so you could get a set of either WW1 or WW2 Revell kits from this range. In much later years they were re-issued (by either the UK or German divisions) and could be bought in superior kit-shops nearer to home. Another reason for our family 'tubeing' to Finchley Road was to connect with a Courtline coach to get us to Luton Airport; Happy Days!

Box Art. Revell positively encouraged purchasers to frame their kit box top pictures, they had the aeroplane name displayed on a 'plaque' as part of each scene. As with Airfix the action was graphic, in one an enemy plane is disintegrating in mid-air after being shot at –such horrors did often happen in this conflict. Later a simple boring photo of a built kit replaced the original style.

Reworking. Available approx. 1975-77 several of these kits (and WW2 types), were reissued by Revell with three markings options and sometimes alternative parts, for instance one Camel was a bomb-carrier, one SE5a had a 4 rather than 2-blade airscrew. One of the Sop Triplanes was the prototype which had a totally different horizontal tail. One of the Nieuport 28's was an unarmed trainer with a fuselage entirely painted in Stars & Stripes wraparound colours. (I think all were in US markings). Note the DH2 & Fokker Eindecker were not included in this reworked series making them

rarer finds. Soon, probably for cost considerations these 'Collector's Choice' kits were replaced by single-option only but at least one –the Morane Saulnier had markings for a red-nosed RFC machine instead of the Imperial Russian finish which included a skull & crossbones across the fin and rudder. The cheapness of these Revell kits meant I was able, in some cases to buy more than one and come up with alternative colour schemes. A 2003 Revell Germany catalogue only showed the Fokker DR1 and DVII as still being available in 1/72 scale. I think some of these WW1 moulds may have later been reissued by other companies –for instance I think I saw the Spad XIII with Italian markings.

Dave Deal's Insane Planes. A real Californian maverick he came up with four grossly exaggerated 'cartoon airplanes' in kit form. The Baron and his Funfdecker Fokker had five wings and was made of red & chrome plastic. Lucky Pierre of the Lafayette Escadrille (Nieuport 17) appeared in 1970 and 1972 respectively. Two silly WW2 examples loosely based on a Spitfire & Bf 109 also appeared in 1972 but I suspect all soon vanished. All had Peel-n-Stick transfers. These were larger than 1/72 but thought I'd mention them anyway. Arguably better researched 1/72 kits have since become available including some incredible types. I hope to list some of these in a future article.

Credits. Airfix - Celebrating 50 Years of the Greatest Plastic Kits in the World, Arthur Ward, 1999 (& also his booklet The Model World of Airfix (1984). Remembering Revell Model Kits, Thomas Graham, Schiffer Book. 2nd Edition. As well as several battered and drawn-upon catalogues (One of which corrected a Revell name!) Happy Modelling!

Armistice Centenary – 1918 - 2018.

I was most impressed in the period up to, and on 11th November, 2018 to see so many moving TV programmes and newspaper articles there were relating to the First World War and to the Armistice which brought it to an official end. *'They Shall Not Grow Old'* was produced by Wingnut Films with Peter Jackson and commissioned by 14-18 NOW and Imperial War Museum. Footage of men setting off to war from the UK and arriving in France before going into battle was familiar stock black & white images. However, technology and research saw the images transform into colour once the Tommies reached the Front. It wasn't comparable to modern-era re-enactments as you realised this was for real – the blood was red and some photographs of shattered and diseased bodies brought home the horror. Seen too was the squalor of 'chatting' – removing lice & their eggs from uniforms and of seeing large rats scurrying round. When the men were on a lull it was good to see them try and relax, though much of these images were probably posed for the cameramen. Again, as the survivors reached the coast to come home the film reverted to black & white. Various statistics were scrolled as were the names of all those whose subsequently-recorded memories for the IWM were played as a soundtrack throughout the film were shown. Regiments were given where known but I was interested to see that some were from the RFC & RAF although no planes appeared during the film.

Emmerdale 1918 was a series shown in the weeks prior to 11th Nov. In this each episode showed a cast member from this soap recreate the story of a real local Yorkshire man or woman involved in WW1 from the neighbourhood/village where the TV show is set. This too was interesting and included the sad tale of a Conscientious Objector sentenced to hard labour for refusing to participate in battle, even as a stretcher-bearer. The run concluded with a Victory Parade in the village concerned. Unlike the projects above, the **Battle of Britain Model Squadron** was an aviation 3-parter in which radio-controlled flyers flew large model warplanes to simulate real documented Battle of Britain era raids. It turned out to be more interesting than I'd predicted as real Squadron Ops Records were quoted and some veterans from the war were interviewed. Laser technology enabled aircraft to trigger smoke in an opponent whilst small on-board cameras offered a 'pilots' eye perspective'.

Friday Nov 2nd saw a ceremony at the Polish War Memorial commemorating the 70th anniversary of the construction of this magnificent monument honouring the Polish Airmen who fought with the RAF, including from nearby RAF Northolt. A trail was announced which leads from the bunker within the former RAF Uxbridge, to the Polish War Memorial, past RAF Northolt once home to Polish crewed Hurricanes, then Spitfires, stopping for refreshment at The Orchard, favoured haunt of such airmen (& their sweethearts), before concluding at the Northwood cemetery where several fallen comrades now rest in peace. Credit 'Hillingdon People' the magazine of London Borough of Hillingdon.

California Wild Fires. Events in California were apocalyptic when viewed on the ground and also from space. The most-ironically-named town of Paradise was all but obliterated. Homes of celebrities fared no better from their neighbours although the fires randomly spared some folk. A fire chief said the Santa Ana winds were capable of blowing embers up to 2 miles and thus starting new blazes. On TV I saw various water-dropping rotorcraft in action, the big 'uns being Sikorsky Skycranes. With dangling hoses and undercarriages, they resembled grotesque giant insects. Other fixed wing helpers included a MD-80 and a DC-10 reconfigured as fire retardant droppers. I saw a Bronco, presumably used to spot fires and I suspect Canadair amphibians & other types have joined in.

President Trump initially criticised the US Forestry Service for what is acknowledged as the worst such event in the region (matching his Presidency). He then backtracked and provided funds, while denying global warming might be a factor).

Douglas Departures. The two DC-6s at Coventry should have moved on by the time you read this. G-APSA was being dismantled by October for ‘roading’ to MoD St. Athan where this airliner will be maintained in taxi condition. G-SIXC, (con no 45550) is also intended for road transport to St Athan but the exact role for it isn’t yet revealed. The Sixes that didn’t make it to Air Atlantique service.

Registration/date	Con no
G-SIXA	45326, DC-6B
	Originally CF-CZS Canadian Pacific Airlines ‘Empress of Montreal’, delivered 30.4.57.
	Bought from Greenlandair 5.79, OY-DRM by Air Atlantique. Believe found too corroded so sold as scrap .82, broken up at Manston, Kent 4.85 still in Greenlandair red-top c/s
G-SIXB	45329, DC-6B
	Originally CF-CZV Canadian Pacific Airlines ‘Empress of Suva’, delivered 15.8.57.
	Bought from Greenlandair 3.79, OY-DRC by Air Atlantique.
	Sold to Air Swaziland 12.79 as 3D-ASA (later 3D-ASB). Several subsequent owners.

At North Weald the C-54 Skymaster charity continues to raise funds in order that C-54Q 56498, the surviving one of a pair flown in several years ago, will someday fly again.

Bristol Freighter Found. Con no 13074 a B.170 Mk 31E of North Coast Air Services, registered CF-UME landed on a frozen Yukon lake (actually Baker Lake, NT) on 12 May 1969. One main-wheel broke through the ice and when immediate salvage attempts failed it was left to sink. Last August archaeologists Doug Davidge and Steven Hanulik used high resolution sonar to find the wreck and a remote submersible camera drone to photograph it. The pic in Flypast Dec 2018, showed a close-up of a red spinner, prop blade tips and the cooling fan for the Bristol Hercules radial. Visibility seems limited. Theoretically the aeroplane is complete and whilst no immediate plans to raise her have been revealed – well maybe one day? I hope to do a future article on Biffo’s in Canada –the harsh conditions meant many expired there. (*Extra info came from The Bristol 170 Freighter, Wayfarer & Superfreighter by Derek A King, Air-Britain 2011*).

Military wrecks found this year have included a Bf 109G and an Il-2 Sturmovik from different watery graves in Russia. Both may be eventually restored to airworthy condition. Reports were in Aeroplane & Flypast. A swarm, or whatever the collective noun may be of Bats is heading for the UK. The Tupolev Tu-2 is probably less well-known than the Petlyakov Pe-2. Both were mid-WW2 fast twin-motor bombers, both with twin tails but the Petlyakov had inline engines (& was subject of an Airfix kit). The rather larger and more burley Tupolev had radial engines and was given the NATO reporting name of Bat. Post 1945 the type was developed further featuring 4 rather than 3-blade props. I believe some flew with the North Korean forces and the type was exported to Poland and China. The Chinese not retiring their last examples from second-line duties until about 1982! It is believed the cache bought by a Midlands-based collector are late 40’s vintage ex Chinese examples and at least one will be made airworthy. East German kit firm *VEB Plasticart* once made a fairly crude 1/72 kit of the Bat, 4-blade-prop variant. I painted mine as a preserved Polish AF machine. The kit featured openable bomb bay with a massive black-plastic bomb which looks more appropriate for a WW 1 bomber! I recall once seeing footage during the Hungarian revolution (I think). A war memorial featuring a large-scale Tu-2 is blown up by demonstrators.

Flybe problems. Originally formed as Jersey European Aw, then re-branding as British European, this firm has been having a difficult second half of 2018, profits nosedived 54%. City AM on 30 Oct said their share value had fallen, accompanied by nice action shot of DASH-8 G-JEDR about to land, the high-wing turboprop is in a mostly purple livery. By Nov 15 it was announced that Flybe had called in accountants from KPMG to handle sale of this loss-making airline. A day or so later it was announced that part of their Exeter Airport HQ site was being sold-off in an attempt to raise £5m. Virgin Atlantic has since begun negotiations to take over Flybe, in order to use the carrier for feeder services to connect with their long-haul network.

Boeing revealed ‘Odysseus’ on Nov 14. This is an autonomous aircraft which will garner data on climate research. It can monitor the Earth’s vegetation, ice states and even ground moisture. As it is solar powered it can roam the heavens indefinitely. Weather & storms can be recorded. The craft, (sadly not illustrated in the City.AM article) was designed by Aurora Flight Sciences, part of Boeing. NASA photographs meanwhile revealed the horrors of the Californian wildfires during November.

Several ex Turkmenistan Airlines EZ-registered Boeing 717s have been ferried in to Cotswold, Gloucestershire Airport (Kemble to us older-thinking people). They will be parted-out, that is dismantled for spares with the remainder

being scrapped. EZ-A106 was the first to arrive there, 23 Sept.

'Local' News. A fellow called Mark Lemon who is a volunteer at the Bentley Priory Museum, RAF Fighter Command HQ in WW2, recently visited Weatherspoon's The Greenwood Hotel in Northolt. He subsequently wrote a complimentary letter to 'Spoons in which he praised staff for arranging one area as a memorial to RAF Northolt. He also told the story of his mother Peggy Lemon (nee Champion) who was both a bargirl and a 'Spitfire Girl'. The story bears repeating... Born in 1922, Peggy worked in The Shoulder of Mutton public house, Salisbury. In late 1940 Spitfire production had been outsourced to various places away from Southampton where the main factory had been bombed by the Luftwaffe. Late in 1940, aged just 18 she was accepted as a worker at the Anna Valley motor garage in Salisbury. Here she helped fabricate Spitfire wing leading edges and gun-heating systems in between-which she did spells of spray-painting the wings. Mark says that the confined environment and lack of ventilation caused havoc with the girls' health. Paint was lead-based at the time, the girls painted for a couple of week's time until their skin went a sallow grey colour – they were then transferred to the production line until they had 'pinked-up' again! The wings were taken away each night for attachment to the fuselages. The workers never knew where their wings went... and never asked. The article, in larger form appears in the Winter 2018/2019 issue of Wetherspoon News and Peggy is seen admiring a large metal Spitfire model. Mark too is pictured, outside The Greenwood Hotel – a venue I keep meaning to visit. Congrats too to the Woodman pub in Ruislip, I'm sure their beer is great too but the place actually won the business category for Hillingdon in Bloom, for their pub garden.

Trains that Changed the World was a series on one of the channels this winter. Whilst logically nothing to do with aeroplanes you may be surprised! Firstly, they showed the high-speed express locos our rival railways had commissioned, an image taken from a plane showed one such train overtaking a Puss Moth. Then German trains were described, an experimental single unit designed by a Zeppelin employee and called something like the 'Shinen-Zeppelin' (exact name unconfirmed and never displayed in the excerpt), was a highly polished silver projectile. A streamlined nose was married to streamlined wheel fairings but the motive power was a huge aero-engine driving a gigantic twin-blade pusher propeller. There was absolutely no cage or guard around this mincing machine and the type was seemingly judged too much of a danger to spectators to ever be adopted, but footage of it in trials was shown. A more conventional high-speed train commissioned for the Berlin-Hamburg route followed and it was used for a time under the name of 'The Flying Hamburger'. The episode concluded with the heyday of streamliner trains in the USA (1930's onwards). It was explained that they had to compete with the airlines and footage of contemporary airliners followed including a preponderance of Boeing 247 footage.

Hellcat Story. Lt Col Ron Richardson, age 27, failed to return from a 1944 mission to take on the Tirpitz in a Norwegian fjord. His grandson, Cdr Philip Richardson, also a RN pilot has tracked down the crash site, 3,000 ft up a mountain. An empty grave was nearby. During the war locals moved the body to an unmarked military grave in Tromso. Article in Metro 19 Oct and accompanied by photographs.

Wellington Story. Sgt AG William Marett, from Jersey became RAF bomber crew. He was 23 when he and his crewmates died in the crash of Wellington of 149 Sqn in Holland 14 March 1941. When a water-filled crater dried up remains of the plane were found last summer. Researchers are trying to contact any of his relatives.

Former **US President George Bush Snr** died at the end of November, Trump and all the surviving ex-Presidents attended ceremonies but the most iconic image was G.W. Bush's service dog Sully lying down beside his master's flag-draped casket at Houston. The fact that former USN pilot Bush was shot down and rescued at sea (filmed at the time), also featured in media tributes to the man, his son, of course also became a US President. Incidentally I now know that if a President flies in a Marine helicopter it is designated 'Marine One' and presumably if they were to fly aboard a Navy or Army machine the designation would be suitably altered. President Trump was criticised for failing to attend a ceremony in northern France –Ainsne-Marne American Cemetery, near Belleau Wood commemorating US deaths in WW 1. He was meant to lay a wreath but claimed the weather was too poor for his helicopter 'Marine One' to make the journey. People than asked why on earth didn't he go by car instead. The Whitehouse than said that he hadn't wanted to disrupt Paris traffic with a motorcade.

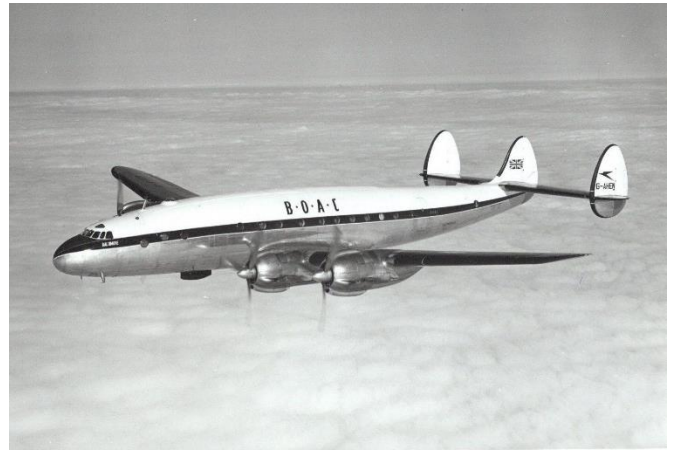
On November 20 it was announced that the water cannon that Boris Johnson purchased and then found he wasn't permitted to deploy them will be (or have been) scrapped. I'm surprised a role couldn't have been found for them, not on the streets but maybe as part of the fire-fighting resources of a major UK airport?

Mental health has rightly been debated recently be it 'shell-shock' as defined in and after WW1 to Post Traumatic Stress Disorder (PTSD) as defined today. Prince William, the Duke of Cambridge, admitted to journalists that he felt mental trauma during his 2015-2017 stint as a pilot with East Anglian Air Ambulance.

Down Memory Lane; Aircraft of BSAA, BEA, BOAC and British Airways - 1940s to 1980 - by L Hayward



Above, top to bottom row; BSAA Lancastrian Sky Ambassador, Avro Tudor V, Dakota (ex-military) used by BEA, Vickers Viking of BEA possibly at Northolt, Airspeed Ambassador in snow at Heathrow 1955. Short Sunderland Mk III over the Needles, IOW. BEA's Silver Wing service to Paris and lastly BEA Dakota & Ambassador.



Above top to bottom row; BEA Vickers Viscount, BOAC Lockheed Constellation, BOAC Argonaut, BOAC Stratocruiser, BOAC Comet 4, a BEA Trident, a British Airways Boeing 747 in an old-style scheme, and a BAC-111 in a scheme in use until circa 1981 when BA dropped the word 'airways' for a period of time.

Postscript to article on crash of Air France Airbus A330 into Mid-Atlantic by Bob Hickox

Further to my article above published in Airwords some months ago, the following Times Newspaper extract of recent date emphasizes the point I was making about inexperienced airline pilots without sufficient training in basic flying skills at all altitudes, who are unable to recognize and regain control when the flight management computer flying the aircraft presents conflicting messages, especially at high cruising altitudes.

Hi-tech is eroding old skills
Analysis

However fault is found in the Lion Air disaster, the accident illustrates a huge problem facing airlines (Charles Bremner writes). The systems designed to make flying safer are confusing pilots. And in a vicious circle, automation is eroding the old-fashioned flying skills that pilots need to keep planes in

the air. Several accidents have occurred after crews were confused by malfunctioning systems and failed to take back control the old "stick and rudder" way. The most notorious instance was Air France flight 447, which crashed off the coast of Brazil in 2009, killing all 288 aboard. After a brief computer upset, caused by faulty airspeed readings, two young co-pilots failed to understand that their Airbus was in a stall.

Pilots are increasingly required to rely on the automation that planemakers are installing. With pressure to keep costs

down, crews use the automatic pilot for most phases from just after take-off until they land. This is especially the case outside the developed world. At a time of pilot shortages and high training costs, pilots are becoming captains without the experience of those who rose through the ranks.

The Lion Air pilot, flying in fine weather, should have realised the airspeed indication was wrong. Keith Mackey, a Florida-based safety consultant told *The Seattle Times*, the local newspaper on Boeing's home turf. Charles Bremner has been a pilot for 34 years.

Also, I talked about "Coffin Corner" when at high altitude when the speed between supersonic buffet and high-speed stall is very limited. In his book "QF32" Captain Richard de Crespigny describes an occurrence when he was flying the Boeing 747-400 which was the first Boeing airliner with the full flight management system which also warned pilots of an impending stall and to prevent flight into "Coffin Corner". The computers and automation were a great flying aid but they were not fool proof. Pilots still needed to carefully read and interpret the computers and flight instrument displays.

In this case Captain de Crespigny recalled they were flying in a Boeing 747-400 at 35,000 feet, close to their maximum altitude. Meanwhile a 747-400 from another airline came from behind 4000 feet above. De Crespigny's instruments showed that they were cruising with a speed margin of plus/minus 5 knots. Their aircraft would get supersonic buffet if they

sped up 5 knots or might stall in a turn if they slowed down 5 knots. As the 747-400 behind them was probably heavy it should not have been that high and would have had no speed margin to play with.

Captain de Crespigny then passed a waypoint where the route turned through a 40-degree angle, an unusually large change in direction. As they turned, their speed tapes showed the previous 5-knot margin was now pinched down to almost zero. The thrust increased to the maximum cruise limits and little by little they carefully made their way through the turn making sure that they did not enter "Coffin Corner".

However, the trailing 747-400 at higher altitude hit and then penetrated "Coffin Corner". Their speed tapes must already have showed little margin when they were flying straight. But in the turn their speed margin reduced to zero and engine thrust at that altitude was insufficient to counter the increased drag.

With stalled wings and insufficient thrust they went down to 35,000 feet in 30 seconds. This would have given everyone on board a nasty fright and may have caused injury to some. The engineer in earlier series 747's would have warned the pilots not to climb so high, but the engineer had been replaced by computers and the pilots didn't understand their jet's performance.

They probably understood the yellow no-go speed zones on the speed tape, but they did not know the autopilot would mindlessly bank the aircraft into a 20-degree banked turn at high altitude. They could have negotiated the turn more safely if they knew they could limit the bank angle. But they had no idea about this. There is one potential problem with automation, that it will be accompanied by complacency and ignorance.

The older jumbos, the numbers of which still flying are in a steady decline, had the manufacturers' philosophy of building aircraft around the captain and engineer. They were supposed to know every part of their aircraft and how to operate it. When the systems failed the crew knew how to diagnose the problem, apply a remedy, and hopefully avert a disaster. Their legacy aircraft might have been simple, but the crews could more easily save their aircraft than with the added complication of having a contrary reading flight management system, as occurred with the Air France A330 disaster.

Reference: QF32 – Richard de Crespigny

The Loss of Imperial Airways Short S23C 'Empire' Class Mk II Flying Boat G-ADUU, 'RMS Cavalier'.
Written by Colin Pomeroy, via David Kennedy

NOTE this article appeared in issue 122 of The Shackleton Association's magazine *'The Growler'* and is reproduced verbatim by permission of Bill Hercus (Editor of *The Growler*) & Colin Pomeroy. I'm also most grateful to Roger White for negotiating our use of the article in Chiltern Airwords –David Kennedy. Having read the story of the delivery flight of the Empire Class flying boat *Aotearoa* to New Zealand in the 'Summer 2018' edition of *'The Growler'*, I thought that readers might like to hear the story of another Empire Class boat, the *RMA Cavalier*. In the late 1930s it was decided that Imperial Airways and Pan American Airways would start a route-sharing service in 1937 between the US mainland and Bermuda and the inaugural service was flown on 8th June 1937, the aircraft crossing midway between the two marine airports of Darrell's Island, Bermuda, and Port Washington, New York but not spotting each other. All went well, with Imperial Airways achieving regularity factors of almost 97%, until Saturday 21st January 1937. On that day, under the command of Captain 'Roly' Alderson, *Cavalier* (G-ADUU) departed at 10.38 hrs (EST) from Port Washington in Bermuda, the aircraft's 290th revenue flight between the two countries. On board was a normal crew of five; Captain Alderson, plus First Officer N. Richardson, Radio Officer P. Chapman, Purser D. Williams and Steward R. Spence), and eight passengers. For almost two hours *Cavalier* cruised south-eastward until, at 12.25 and with the Purser Williams and Steward Spence preparing the silver service lunch, Captain Alderson decided to climb from his initial cruising level of 9,000 feet to seek smoother air. The forecast for airframe icing had already been encountered, but not enough to give any handling difficulties, so no problems were anticipated on entering high cumulous cloud in the climb. However, after about ten minutes, power began to fade on all four Pegasus engines and the standard procedure of opening and closing the throttles failed to regain full power- the inboard engines being particularly badly affected. Captain Alderson decided to descend back to a lower level to seek the clear air just left behind, but failed to find it and turned back once more on to his heading for Bermuda. The outer engines gave some power; the inners stubbornly refusing to pick up again. *Cavalier* was suffering from severe carburettor icing, blocking off the airflow to the engines. Although frontal cloud had been forecast on the direct track between New York and Bermuda that being encountered was much more severe than anticipated, and at 12.23 hours Radio Officer Chapman had transmitted "*Running into bad weather. May have to earth*" meaning that he might have to haul in the aircraft's trailing wireless aerial and cease transmitting. This message was later incorrectly released to the press as "... may have to land". Four minutes later he broadcast "*Still in bad weather. Severe static*". For over twenty minutes the pilots struggled to restore full power. Different heat settings on the carburettors were selected and the fuel tank selections were checked to ensure that fuel starvation was not the cause of the power loss, but all to no avail – and the aircraft continued to descend at five to six hundred feet per minute. At 12.50 hours a Pan/XXX message was transmitted, upgraded to full distress at 1257 hours. "All engines failing through ice. Altitude 1,500 feet. Force landing in a few minutes". Port Washington acknowledged these calls, which were received in Bermuda at the same time. The crew prepared for a force-landing. As the life jackets were distributed, a third engine spluttered to a stop and at 13.11 hours, at a speed of some 110 mph with less than full landing flap available, Captain Alderson eased *Cavalier* down on the surface of an unexpectedly rough sea. Under the circumstances, the touchdown was a good one, but the aircraft's hull stove in just aft of the main step on the third bounce and water quickly started to enter the main cabin. Before the batteries became covered with water and his radio useless, Chapman was able to transmit "*Landed OK. Switches off. Stand by*". This was only heard in Bermuda. Only one passenger, a Mr Noakes who had been standing up at the moment of impact to see for himself what was happening, was injured in the landing, but it was a serious head injury and he was never to regain full consciousness. It was obvious to the crew that the flying boat would not stay afloat for long and Captain Alderson ordered it to be abandoned, just before it broke in half and sank. No life rafts, flares or emergency radios were carried in those days, soon the thirteen people who scrambled into the water had only their life jackets and their spirits to keep them afloat and alive. Another passenger, Mr Miller, a poor swimmer, had jumped out carrying (not wearing) his life jacket. He was twice washed heavily against the hull and, less than ten minutes after touchdown he was seen by passenger Miss Smith, to disappear below the waves. The Captain's decision to continue back to Bermuda rather than turning back to mainland USA, proved to be both a good and a fortuitous one, for the aircraft had come down in the Gulf Stream and hypothermia was not an immediate problem for those still surviving.

Ashore, a rescue operation was mounted. The Imperial Airways Station Manager in Bermuda and qualified line captain, Captain 'Taffy' Powell, assisted by a radio bearing from the Bermuda Cable & Wireless station, had estimated the ditching position as being at 37°17' North 060°45' West; he requested that Pan Am Sikorsky S-42 crew currently in Bermuda to take-off to search for survivors. The S-42 was rapidly refuelled and, with Captain Lorber at the controls, S-42 'Betsy' lifted off at 1400 hours and headed north-westward. The US Coastguard sent a flying boat from Long Island to the datum, and the Royal Canadian Navy destroyer *HMCS Saquenay* slipped her moorings in Bermuda Dockyard at 16.30 hours and headed seawards. Darkness was now the main enemy; the Coastguard aircraft had less than 90 minutes of daylight in the area, whilst Captain Lorber found that he would not reach the search area until well after sunset and decided to return to Bermuda to take-off early the next day in order to arrive at the search area at first light. Meanwhile the twelve survivors had become eleven, for the injured Mr Noakes succumbed to his injuries shortly after darkness fell. Sadly, not too long afterwards, Steward Spence, who had worked so hard to ensure his passengers safety, became delirious and also passed away. Then, some twenty-five minutes before midnight, salvation came in the form of the tanker Esso Baytown, under the command of Captain Frank Spurr, which had been on passage in ballast between Boston and Baytown, Texas and had increased speed to her maximum 13 knots on receipt of the distress message and arrived in the general search area at 21.30 hours. (The ship only carried one wireless operator and he had been off duty when the call to shipping was broadcast, but the automatic alarm on the 500 kc/s distress frequency had operated correctly and called him to his equipment). At 23.25 hours, having arrived at his own estimate of Captain Powell's datum, Captain Spurr ordered the Esso Baytown's engines to be stopped. The sea captain's brilliant navigational skills (using nothing more than a trailing log, M/F D/F and Astro), coupled with Captain Powell's intuition paid off, for remarkably the voices of the survivors were heard and the ship's searchlight soon picked them out. In ever roughening seas, a lifeboat was launched and the ten survivors were dragged over the gunwales – Captain Alderson by now very weak and kept alive only by the ministrations of passenger Mrs Watson. All were lifted aboard the Esso Baytown by breeches buoy and, some 90 minutes after heaving to, the tanker was on her way once more. At 0020 hours she signalled "*We have picked up ten survivors. These survivors feel that the other three are lost. We need a doctor badly*". The gunboat Erie and the Coastguard Cutter Champlain responded, the former putting her doctor and pharmacist's mate aboard the rescue ship. Champlain and seven other vessels continued to search the crash site but, although there was extensive wreckage still floating, no further signs were found of the missing Steward Spence or passengers Miller and Noakes. The Esso Baytown set off for New York where, on the morning of Monday 23rd January she docked at Manhattan's Pier 9, to be greeted by a large crowd of onlookers. An investigation into the forced-landing was launched and the report, dated 28th February 1939, concluded that the cause of the engine failures was, indeed, severe carburettor icing. Imperial Airways was criticised for not taking more positive action over earlier incidents of a similar, but much less catastrophic nature, and the modification action to the carburettor heating system which had been called for. The Inquiry Team also recommended that the passengers be instructed in the use of seat belts, life jackets, and emergency exit and that the use of seat belts for take-off and landing be made compulsory. It further recommended that additional lifesaving equipment – such as life rafts, or boats, pyrotechnic signals, rockets and a waterproof emergency radio – be carried on overwater flights. An additional recommendation was that flights of this nature should carry a navigator, for so busy was Captain Alderson and First Officer Richardson in trying to restore power that the only position actually broadcast from *Cavalier* was the routine one at 1200 hours. Nobody had had the time to work out a ditching position for the radio operator to send with his SOS! (Captain Alderson returned to flying, finally retiring in 1962. He passed away in June 1993, one of the great pioneers of long-range civil aviation. Mrs Watson was awarded the British Empire Medal for her steadfastness and bravery, and Steward Spence's devotion to duty is commemorated on a plaque in the Cathedral of the Most Holy Trinity in Bermuda's capital, Hamilton). (Captain 'Taffy' Powell returned to the RAF on the outbreak of war and as an air commodore was Senior Air Staff Officer at RAF Ferry Command, later Ferry Group of Transport Command, and held overall responsibility of the Lend Lease aircraft delivery flights to the UK across the lonely North Atlantic. In later years he formed Silver City Airways, operating Bristol Freighter aircraft to and from Europe in the car and passenger-carrying role).

References: www.thegrowler.org.uk which is the website for The Shackleton Association, which was founded in 1987 by John (Mo) Botwood. Many CAS members remember the Shackleton fondly & were delighted at the sound of an engine run on our visit to Baginton some years ago.

1969.

January 2 A hijacker commandeers an Olympic Airways Douglas DC-6B during a domestic flight in Greece from Heraklion, Crete, to Athens and forces it to fly to Cairo, Egypt.

January 5 – The flight crew of Ariana Afghan Airlines Flight 701, a Boeing 727-113C, (registration YA-FAR) fails to extend the airliner's flaps while on approach to London Gatwick Airport in heavy fog. The plane crashes short of the runway, striking a house in Horley, Surrey, England, killing 48 of the 62 people on board and two people on the ground. All 14 survivors are injured, as is one person on the ground.

January 7 – A male passenger hijacks Avianca Flight 654, a Douglas DC-4 (registration HK-1028) making a domestic flight in Colombia from Riohacha to Maicao with 60 people on board, and demands that it fly him to Cuba. After a refuelling stop at Barranquilla, Colombia, the airliner continues to Cuba, landing at Santiago de Cuba.

January 9 – Saying he hates the United States, loves the Soviet Union, and is on the run from the U.S. Federal Bureau of Investigation, 21-year-old Ronald Bohle hijacks Eastern Airlines Flight 831, a Boeing 727 flying from Miami, Florida, to Nassau in the Bahamas with 79 people on board, and demands to be flown to Cuba. He holds a flight attendant hostage with a 7-inch switchblade until disembarking in Cuba, where he is imprisoned.

January 11 -- Believing himself to be a key operative in a large conspiracy by the U.S. Federal Bureau of Investigation and the U.S. Central Intelligence Agency to assassinate Fidel Castro, Robert "Red" Helmey enters the cockpit of United Airlines Flight 459 – a Boeing 727 flying from Savannah, Georgia, to Miami, Florida, with 20 people on board – with a 0.38-calibre pistol and orders the flight crew to fly him to Havana, Cuba. The Cubans imprison him upon arrival, keeping him in solitary confinement for 109 days before allowing him to return to USA

A hijacker takes control of an Aérolíneas Peruanas (APSA) Convair CV-990 Coronado flying from Panama City, Panama, to Miami, Florida, and forces it to fly to Cuba.

January 13 -- With its cockpit crew so occupied with attempting to diagnose the lack of a nose gear green light that they inadvertently allow its rate of descent to increase while on approach to Los Angeles International Airport in Los Angeles, the Scandinavian Airlines McDonnell Douglas DC-8-62 Sverre Viking, (registration LN-MOO) operating as Flight 933 with 45 people on board, crashes in Santa Monica Bay 6 miles (11 km) short of the runway and breaks into three pieces, two of which sink immediately. Fifteen people die, and 17 of the 30 survivors are injured.

January 14 -- The United States Navy announces that the Grumman F-14 Tomcat has won the competition for a new long-range fleet air defence fighter.

Off Hawaii, a MK-32 Zuni rocket loaded on a parked F-4 Phantom II aboard the U.S. Navy aircraft carrier USS Enterprise (CVN-65) explodes after being overheated by an aircraft start unit mounted to a tow tractor. The explosion sets off fires and additional explosions across the flight deck, killing 27 and injuring 314 men and knocking the ship out of action until 1 March.

January 18 – United Airlines Flight 266, a Boeing 727-22C, (registration N7434U) crashes into Santa Monica Bay off the coast of California four minutes after take-off from Los Angeles International Airport. All 38 people on board die.

January 19 -- A hijacker commandeers Eastern Airlines Flight 9, a Douglas DC-8 with 171 people on board flying from John F. Kennedy International Airport in New York City to Miami, Florida, and forces it to fly to Cuba. Ten hijackers take control of an Ecuatoriana Lockheed L-188 Electra during a domestic flight in Ecuador from Guayaquil to Quito, demanding to be flown to Cuba.

January 22 – The U.S. 9th Marine Regiment begins Operation Dewey Canyon – an operation dependent completely on helicopters – in South Vietnam's Da Krong Valley. It will conclude on March 19, rated as the 9th Marines' most successful operation of the Vietnam War.

January 24 – A hijacker commandeers National Airlines Flight 424, a Boeing 727 flying from Key West, Florida, to New York City with 47 people on board, and forces it to fly to Cuba.

January 28

Armed with a 0.38-calibre revolver and what they claim is dynamite, prison escapees Bryon Vaughn Booth and Clinton Robert Smith hijack National Airlines Flight 64 – a Douglas Super DC-8 flying from New Orleans, Louisiana, to Miami, Florida, with 32 people on board – and force it to fly to Havana, Cuba, where Cubans imprison them.

Armed with a single revolver, Everett White, Noble Mason, and Larry Brooks hijack Eastern Airlines Flight 121 – a Douglas DC-8 flying from Atlanta, Georgia, to Miami, Florida, with 113 people on board – and force it to fly to Cuba. To prevent panic, the captain does not inform the passengers that the airliner is diverting to Cuba.

February 4 – The last surviving XB-70 Valkyrie – the U.S. Air Force's XB-70A Air Vehicle 1 (AV-1) – makes its last flight, a subsonic trip from Edwards Air Force Base, California, to Wright-Patterson Air Force Base, Ohio, where it is retired and will be placed on display at what is now the National Museum of the United States Air Force.

February 5 – A male passenger hijacks SAM Colombia Flight 601, a Douglas C-54G-1-DO Skymaster (registration HK-1065) with 47 people on board, during a domestic flight from Barranquilla to Cartagena and forces it to fly him to Santiago de Cuba in Cuba.

February 8 – Demanding to be flown to Cuba, a hijacker attempts to take control of a Douglas DC-6 airliner during a flight in Mexico from Mexico City to Villahermosa, but is subdued.

February 9 – First flight of the B747-121 (registration N7470) named 'City of Everett'. The aircraft is now preserved at The Museum of Flight Seattle, Washington.

February 11 – Three hijackers take control of a Linea Aeropostal Venezolana (LAV) Douglas DC-9 flying from San Juan, Puerto Rico, to Miami, Florida, and force it to fly to Cuba.

February 18 -- Four members of the Popular Front for the Liberation of Palestine attack El Al Flight 432, a Boeing 720-058B with 28 people on board, with AK-47 assault rifles and hand grenades while it is preparing for take-off at Zurich Airport in Zürich, Switzerland, mortally wounding the first officer and injuring six other people.

An Israeli undercover security guard on the plane opens fire on the attackers from a cockpit window, then gets off the plane and continues to fire on them, killing their leader before Swiss police arrive and arrest him and the three surviving attackers. The incident reveals for the first time that armed security personnel ride aboard Israeli airliners.

February 18 -- Nevada Airlines Flight 708, a Douglas DC-3 / C-49J, (registration N15570) crashes into a sheer cliff face on Mount Whitney near Lone Pine, California, killing all 35 people on board. The plane's wreckage will not be found until August 8.

February 24 – Far Eastern Air Transport Flight 104, a Handley Page Dart Herald, (registration B-2009) suffers the failure of an engine and attempts to make an emergency landing at Tainan Airport in Tainan City on Taiwan. Before reaching the airport, the plane belly-lands in a clearing in a wooded area, skids into a creek, breaks into three pieces, and catches fire, killing all 36 people on board.

February 25 – Shortly after take-off from Atlanta, Georgia, a male passenger armed with a .22-caliber pistol hijacks Eastern Airlines Flight 955, a Douglas DC-8 bound for Miami, Florida, and forces it to fly to Havana, Cuba, where he remains after the airliner returns to the United States.

1979.

January 1 – Trans World Airlines becomes a subsidiary of Trans World Corporation, along with Canteen Corporation, Hilton International, Spartan Food Service, and Century 21 Real Estate.

January 12 -- Pilatus Aircraft acquires Britten-Norman.

Three hijackers commandeer a Tunis Air Boeing 727-2H3 making a domestic flight from Tunis to Djerba, demanding the release of prisoners. The airliner diverts to Tripoli, Libya, where the hijackers surrender.

January 12 -- Braniff International Airways becomes the only American airline to operate the Concorde as two Braniff pilots land an Air France and a British Airways Concorde simultaneously on parallel runways after flying from Washington Dulles International Airport in Virginia outside Washington, D.C., ceremonially inaugurating a new interchange service allowing the Concorde to operate over the United States. The service functions by having Air France and British Airways crews fly the aircraft from Europe to Washington Dulles, where the aircraft are temporarily leased and re-registered to Braniff and flown by Braniff crews as Braniff aircraft to Dallas-Fort Worth. The process is reversed on the return trip, with Braniff crews flying the planes as Braniff aircraft to Washington Dulles, where they are "sold" back and re-registered to Air France and British Airways before being flown back to Europe by French and British crews. Braniff begins revenue service with the Concorde between Dallas-Fort Worth and Washington Dulles on January 13, charging 10 percent more than it charges for first class on its Boeing 727s flying the route.

January 15 – After its pilot turns off its de-icing system too soon on approach to Minsk-1 Airport in Minsk in the Soviet Union's Byelorussian Soviet Socialist Republic, an Aeroflot Antonov An-24B (registration CCCP-46807) loses longitudinal stability due to icing and crashes 3.3 miles from the airport, killing 13 of the 14 people on board.

January 16 – Six hijackers aboard a Middle East Airlines Boeing 707 bound from Beirut, Lebanon, to Amman, Jordan, demand the release of prisoners. The hijackers surrender at Beirut International Airport.

January 24 – An Air Algérie Nord 262A-44 (registration 7T-VSU) on approach to Boudghene Ben Ali Lotfi Airport in Béchar, Algeria, flies too low and crashes 9.4 miles from the airport, killing 14 of the 23 people on board.

January 27 – A 49-year-old California woman hijacks United Airlines Flight 8 – a Boeing 747 with 131 people on board, including actor Sam Jaffe – as it flies from Los Angeles, California, to New York City. She threatens to blow up the plane if an actor – she demands that it be either Charlton Heston, Jack Lemmon, or Lindsay Wagner – does not read her message on U.S. national television from Los Angeles International Airport, where Heston stands by in case he is needed. About two hours after the airliner lands at John F. Kennedy International Airport in New York, she releases about 25 passengers. Police finally overpower and arrest her about 11 hours after the incident began.

January 30 – Varig Boeing 707-320C PP-VLU, a cargo plane, disappears over the Pacific Ocean 30 minutes after departing Tokyo's Narita International Airport. Its wreck is never found. Lost along with the six people on board are 153 paintings by Manabu Mabe. The captain had been the pilot of Varig Flight 820, which crashed in France in 1973.

February 8 – A TAM Airlines Embraer EMB-110C Bandeirante (registration PT-SBB) strikes trees during its initial climb after take-off from Bauru Airport in Bauru, Brazil, crashes, & bursts into flames, killing all 18 people on board.

February 12 – Members of the Zimbabwe People's Revolutionary Army (ZIPRA) shoot down Air Rhodesia Flight 827, the Vickers Viscount 748D (registration VP-YND) Umniati, with a Strela 2 (NATO name "SA-7 Grail") surface-to-air missile in the Vuti African Purchase Area of Rhodesia east of Lake Kariba, killing all 59 people on board.

February 18 – Flying from Coast Guard Air Station Cape Cod in Sandwich, Massachusetts, in bad weather to rescue a crewman in distress aboard the Japanese fishing vessel Kasei Maru #18, the United States Coast Guard Sikorsky HH-3F Pelican helicopter CG-1432 loses power and ditches in heavy seas in the North Atlantic Ocean 180 nautical miles southeast of Nantucket, Massachusetts. One Canadian Armed Forces and three U.S. Coast Guard personnel aboard die; Kasei Maru No. 18 rescues one U.S. Coast Guard crewman and recovers the bodies of the other four men.

February 19 – American former child actor Norman Ollestad, Sr., dies instantly when the chartered Cessna 172 he is riding in crashes in California's San Bernardino Mountains in adverse weather at an altitude of 7,300 feet. The pilot dies soon afterwards. The two survivors, Ollestad's girlfriend and his 11-year-old son, future author Norman Ollestad, Jr., attempt to descend the mountain. She dies in a fall, but the younger Ollestad survives.

February 26 – Production of the A-4 Skyhawk ends after 26 years, with the delivery of the 2,690th and final aircraft to the United States Marine Corps.

February 27 – Four hijackers commandeer Aeroflot Flight 212 – a Tupolev Tu-154 with 34 people on board – shortly after it takes off from Oslo, Norway, for a flight to Stockholm, Sweden. They threaten to blow up the airliner with glass bottles filled with kerosene. The plane lands at Stockholm, where the crew overpowers the hijackers.

1989.

January 1 – Norway forms the Accident Investigation Board for Civil Aviation – the future Accident Investigation Board Norway – within its Ministry of Transport and Communications.

January 2 – First flight of the Tupolev Tu-204 registration CCCP-64001

January 4 -- Two United States Navy F-14 Tomcats of Fighter Squadron 32 (VF-32) aboard the aircraft carrier USS John F. Kennedy (CV-67) shoot down two Libyan Air Force Mikoyan-Gurevich MiG-23s (NATO reporting name "Flogger") off the coast of Libya using AIM-7 Sparrow and AIM-9 Sidewinder air-to-air missiles. They are the third and fourth of five kills scored by F-14s during the Tomcat's career in U.S. Navy service.

January 8 – Attempting to make an emergency landing at East Midlands Airport in Castle Donnington in North West Leicestershire, England, British Midland Flight 092, a Boeing 737-4Y0 (registration G-OBME) crashes just short of the runway on the M1 motorway near Kegworth, killing 47 of the 126 people on board and injuring all 79 survivors.

February 8 – On approach to Santa Maria Airport in the Azores based, Independent Air Flight 1851, a chartered Boeing 707-331B (registration N7231T), crashes into Pico Alto on Santa Maria Island after a misunderstanding between its crew and air traffic control. All 144 people on board die.

February 19 – Flying Tiger Line Flight 66, a Boeing 747-249F cargo aircraft (registration N807FT), crashes near Kuala Lumpur, Malaysia, killing the entire crew of four.

February 24 – A cargo door failure causes a piece of fuselage to detach from United Airlines Flight 811, a Boeing 747-122 (registration N4713U), over the Pacific Ocean near Honolulu, Hawaii. Nine people are sucked from the plane by explosive decompression to their deaths; of the nine at least one is killed instantly when they are sucked into the number 3 engine. Another 38 people are injured. The plane lands safely at Honolulu International Airport.

Below Left; A poor quality photo of the side of United Airlines Flight 811, after it landed at Honolulu, showing the massive hole in the side of the aircraft and damage to the front of the wing. Below Right; In Sept 1990, two halves of Flight 811's cargo door were recovered from the Pacific Ocean from 14,100 feet (4,300 m) below the ocean surface. The cargo door had fractured lengthwise across the center.



The 747-cargo door used a series of electrically operated latch cams into which the door-edge latch pins closed. The cams then rotated into a closed position, holding the door closed. Electrical switches cut electrical power to the cargo door when the outer handle was closed; however, if one of those switches or the wiring was faulty, the motors could still draw power and rotate the latch cam to the open position in flight at high altitude.



Working with Spanish hybrid-electric light aircraft developer **Axter Aerospace**, US start-up Wright Electric plans to fly a nine-seat demonstrator in 2019 as a step toward an ultimate goal of developing a 186-seat, electric-powered narrow body airliner.

International Airlines Group (IAG) CEO Willie Walsh believes there is a real likelihood that the Qatar Airways' CEO will follow up on his public statements and take the Doha-based carrier out of the oneworld global alliance. **Qatar Airways** "has the potential to form our own alliance" should the airline decide to withdraw from the oneworld alliance, CEO Akbar Al Baker said Nov. 13.

International Airlines Group's (IAG) Irish airline **Aer Lingus** plans to nearly double its long-haul fleet from 17 to 30 aircraft by summer 2023, using the extra capacity to grow its North American presence.

Icelandair Group has abandoned plans to take over fellow Icelandic carrier **WOW Air**. The decision to scrap the deal was made after it became clear that Icelandair could not fulfil the necessary conditions of the share purchase agreement for WOW before a Nov. 30 group shareholders' meeting. Indigo Partners, a US private equity firm that specializes in ultra-LCCs, has emerged as a potential new investor in WOW Air, dramatically changing the fortunes of the airline. The LCC will cut its aircraft fleet by nearly half and reduce its workforce by about 10%.

An **Airbus A330-800** test aircraft completed its maiden flight Nov. 6 from Toulouse-Blagnac Airport over south-western France, which lasted 4 hrs and 4 min.

Bombardier plans to sell the Q400 regional turboprop program to Longview Aviation Capital, parent company of Canada's Viking Air, which previously acquired the rights to out-of-production de Havilland Canada types.

Rolls-Royce will replace turbine blades on some Trent 700 engines powering the Airbus A330 because of corrosion issues the company says are unrelated to the similar, but more widespread, problem affecting operators of Trent 1000-powered Boeing 787s.

China will need more than 7,400 new passenger and freight aircraft over the next two decades, accounting for nearly 20% of the global demand for 37,400 new aircraft expected by 2037, according to the latest Airbus China Market Forecast.

The US FBI investigation of the Horizon Air **Bombardier Q400** crash Aug. 10 has concluded the airline employee who stole the aircraft at Seattle-Tacoma (Sea-Tac) International Airport deliberately crashed it into the ground.

International Airlines Group (IAG) expressed confidence an agreement on air transport with the European Union (EU) would be reached after a Spanish media outlet reported the group was in talks with Spain to protect IAG's EU ownership rights in the event of a no-deal Brexit.

Special commissioners are examining the three offers made for **Alitalia** this week ahead of presenting their conclusions to the government in a long-running process to relaunch the bankrupt carrier. Italian rail company **Ferrovie dello Stato** (FS) appears to be in pole position to acquire the bankrupt airline and is in talks with a number of airlines that could partner with it to run the carrier if its bid is successful.

Swiss International Air Lines (SWISS) will wet lease up to eight Embraer E190-E2s from regional carrier Helvetic Airways in an expansion of the airlines' partnership.

In a move likely linked to the on-going investigation into the fatal crash in October of a Lion Air **Boeing 737 MAX 8**, the aircraft manufacturer has issued a bulletin to operators explaining a system unique to the MAX that automatically pushes the nose down to help prevent stalls in certain flight profiles. The Air Line Pilots Association (ALPA) has called on the FAA and US National Transportation Safety Bureau (NTSB) to assist in providing information on an automated pitch-control system suspected of possibly contributing to the October fatal crash of a Lion Air Boeing 737 MAX 8. A preliminary report on the Oct. 29 crash of Lion Air flight 610 (JT610) confirms the accident aircraft, a Boeing 737 MAX 8, was not airworthy on at least its last two flights, spotlighting gaps in the airline's maintenance practices and safety culture.

Flybe is looking for a buyer as part of a strategic review and is already in talks with "a number of strategic operators" about a potential sale as it seeks to address the difficult conditions airlines are facing, the UK-based regional carrier said.

China Southern Airlines will leave the Sky Team global alliance at the end of next year, a move the airline said will allow it to forge closer ties with other carriers, including oneworld member American Airlines, a part-owner of the Chinese airline.

Delta Air Lines has placed a new order for 10 Airbus A330 Neos, increasing its total order for the wide body to 35, while further deferring delivery of 10 A350XWBs that were previously delayed.

Local authorities have approved **London Stansted** Airport's plans to increase passenger capacity to 43 million annually, allowing 23% growth from the current 35 million limit.

Boeing has rolled out the first high-density seating minor-model derivative of the 737 MAX 8-200 aircraft that is specially modified with an additional set of passenger cabin exit doors so it can seat up to 200, one of its customers for this sub type is **Ryanair**.

The airframe of the first **Boeing 777-9** flight test aircraft has been completed in the company's Everett, Washington, facility marking a key milestone toward rollout and first flight of the initial 777X family variant in early 2019.

Airbus delivered the first A330-900 to launch operator **TAP Air Portugal** on November 26, kicking off a major fleet replacement for the airline.

Air France plans to reduce its 10-strong Airbus A380 fleet by returning at least two and potentially all of the five leased A380s the carrier operates.

LCC **Norwegian** plans to expand its penetration of the South American market with services from London Gatwick to Rio de Janeiro's Galeão International Airport.

All Nippon Airways (ANA) has revealed new details of its plans for its initial Airbus A380s, which will replace other aircraft types on existing Honolulu routes in stages from May 2019.

Slovenia's **Adria Airways** signed a letter of intent (LOI) to acquire 15 Sukhoi Superjet 100s (SSJ100s) via a long-term lease arrangement and signed an MOU with Sukhoi Civil Aircraft Co. (SCAC) to establish a joint MRO operation at Ljubljana Airport. Deliveries are expected to start in the beginning of 2019.

Air France-KLM's new CEO Ben Smith is said to be contemplating the future of Joon—the LCC hybrid sister airline to Air France launched by Smith's predecessor—while considering plans to boost the airline group's profitability.

Airport operator FBB has reaffirmed an October 2020 opening date for **Berlin Brandenburg** International Airport (BER), the airport was scheduled to be operational from late 2011.

The US and UK have agreed an **Open Skies** pact that will allow them to continue liberalized air services after the UK leaves the European Union (EU) in March 2019. Also, a new agreement between the UK and Canada means air services between the two nations will remain intact following Brexit,

Irish lessor **Avolon** has confirmed an order for 75 Airbus A320 Neos and 25 A321 Neos in the single largest order for aircraft from the European manufacturer ever placed by the Dublin-headquartered company.

Virgin Atlantic has no immediate plans to join the Sky Team alliance, despite being part-owned by US Sky Team member Delta Air Lines and alliance partner Air France-KLM being in the process of buying a stake in the carrier.

Swiss charter carrier **PrivatAir** filed for insolvency Dec. 5, including its German subsidiary **PrivatAir GmbH**. "Over the past few weeks, a number of events have had a significant impact on the companies' future business forecast and viability, which forced the companies to file for insolvency,"

The oneworld global alliance announced Dec. 5 that **Royal Air Maroc (RAM)** will become its 14th full member airline, likely being inaugurated in mid-2020.

A Brazilian appeals court has reversed a lower court's provisional decision that would have prevented **Embraer and Boeing** from finalising terms of their proposed joint venture. The two companies have hammered out terms of the commercial business merger, including a Brazil-based management that reports to Boeing chairman, CEO and president Dennis Muilenburg, as well as for a joint venture (JV) to make and sell the medium-lift KC-390 military transport aircraft.

Kuwait-based LCC **Wataniya Airways** has had its air operator's license revoked by the Arab state's aviation regulator and is out of business.

Star Alliance member **Ethiopian Airlines** has been selected by the government of Ghana to create a new national carrier for the country.

Aer Lingus has identified Hartford (Connecticut), Minneapolis/St. Paul (Minnesota) and Montreal (Canada) as the Ireland flag carrier's first North American routes to be operated by the Airbus A321 long-range (LR) version of the A321 Neo, scheduled for delivery from June 2019.

Avianca Brazil reportedly filed for bankruptcy protection Dec. 11, stemming from a potential repossession of 21% of its fleet by the aircrafts' lessor.

American Airlines, Delta Air Lines, and United Airlines are preparing a "strong retort" to **Air Italy's** service additions, calling the Italian carrier's recent and planned moves into US gateways a "clear violation" of an agreement between US and Qatari government officials, Chicago-based United Airlines' top executive said.

Lebanese SkyTeam member **Middle East Airlines (MEA)** has announced plans to purchase four Airbus A330-900 Neos, with options on a further two.

Monarch Aircraft Engineering (MAEL) has been put up for sale by private equity group owners Greybull Capital and its board of directors, the company confirmed Dec. 14.

Newly rebranded **Air Italy** has announced new routes to Toronto and Chicago, bringing to six the number of North American destinations the carrier will fly to from Milan Malpensa Airport.

US regional airline **Republic Airways** has finalized an order for 100 Embraer 175s, and taken purchase rights on a further 100, building on a letter of intent (LOI) that was first announced at the Farnborough Air Show in July.

Nigerian start-up **Green Africa Airways** has committed to purchasing up to 100 Boeing 737 MAX 8 aircraft, Boeing said Dec. 21.

Amazon Air, forging tighter ties with Air Transport Services Group (ATSG), will lease 10 more Boeing 767-300 freighters from the company.