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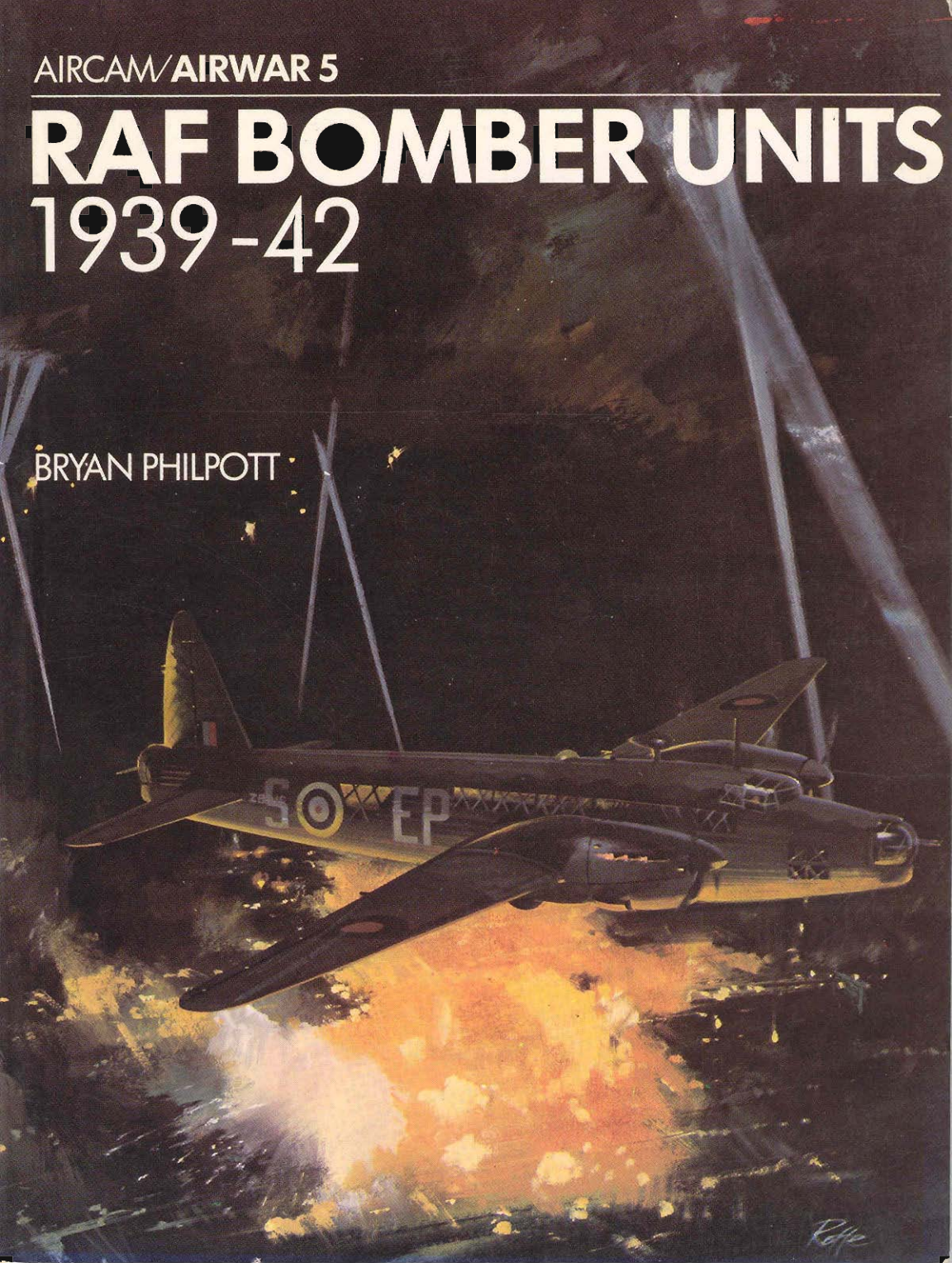
RAF BOMBER UNITS 1939-42

BRYAN PHILPOTT



RAF BOMBER UNITS
SEPTEMBER 1939 to JUNE 1942

BY BRYAN PHILPOTT

COLOUR PLATES BY
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All photographs except where otherwise indicated are from the Imperial War Museum

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THE DEFERRED DETERRENT

One month after the war between Italy and Turkey broke out in October 1911, Lieutenant Cavotti of the Italian Air Fleet dropped four modified 4½-lb Swedish manufactured hand-grenades on Turkish troop concentrations. This comparatively minor event, which was followed by similar aerial attacks during the opening days of November, heralded the birth of strategic bombing. As a result of this activity the Turks protested that the Italian fliers had bombed a military hospital at Ain Zara. The Italian reply was that the same target – which was in fact a collection of tents which may or may not have been used to accommodate wounded troops – had already suffered bombardment from their warships without any form of protest. So, within a few days of the earliest known use of the aeroplane as a bomber, the illogical argument that high explosive shells delivered by artillery were acceptable whereas similar destruction from the air was immoral, was aired for the first time. It was an argument that would be discussed on many occasions, and one that was destined never to produce a satisfactory answer.

The introduction of a third dimension to warfare was viewed in many different ways by those who were used to the two dimensions of land and sea. In England the army and navy both felt that the aeroplane had only a limited use, i.e., in reconnaissance roles, and that each should control its own air force. The formation of the Royal Naval Air Service, controlled by the Lords of the Admiralty, and the Royal Flying Corps, controlled by the army, seemed to be an ideal solution to the problem. But by the third year of World War I the British Government realized that a central authority responsible for matters relating to air power, would be better than the shared responsibility of the Admiralty and War Office, who tended to blame each other when things went wrong. A decision was taken to overhaul the organization of British Air Power and General Jan C. Smuts was asked to carry out a survey and make recommendations to this end.

On 17 August 1917 Smuts submitted his findings in which he proposed the formation of an Air Ministry, the appointment of an Air Minister with a consultative board responsible for all matters relating to the control and administration of every kind of aerial warfare. The Air Minister and his staff were to be responsible for the amalgamation of the RNAS and the RFC, as well as the preparation of legislations and regulations covering the new air service.

The report was accepted and, on 1 April 1918, the Royal Air Force under the control of an Air Ministry came into being. By this time the war was nearly over but in the final seven months several important changes were put into effect and these greatly improved the effectiveness of British air power, especially as far as defence was concerned.

One of the most important innovations to come about was the setting up of a long-range bomber force, known as the Independent Air Force, whose aim was the strategic bombardment of centres vital to the enemy's war effort. Under the command of Gen. Hugh Trenchard, this bomber force was based in France and it opened its campaign on 6 June 1918 when D.H.4s of No. 55 Squadron bombed factories, the railway station and army barracks at Coblenz, and D.H.9s of No. 99 Squadron raided rail targets at Thionville.

One month later on 24 July Sgt. L. A. Dell of No. 214 Squadron flying a Handley Page 0/400, dropped the heaviest bomb used so far, when he deposited a 1,600-lb weapon on Middlekerque.

It would be unfair to claim that these and other

raids by the Independent Air Force produced decisive results, but they did act as an irritant to the German Government and resulted in the withdrawal of some fighter squadrons from the Western Front to the defence of the German homeland.

When the war ended on 11 November 1918, the Independent Air Force had only eleven squadrons, their main equipment being D.H.4 and D.H.9 aircraft whose bomb load of 500 lbs and radius of action of 100 miles, hardly made it a powerful force; but it was a start and a step in the right direction for the embryo Royal Air Force. The 1914–18 war had produced no convincing proof of the offensive power of aircraft, but it had shown that bombers could penetrate enemy air space although the lack of planning, selection of suitable targets and the inability to sustain concentrated attacks had brought no decisive victories directly attributable to the bomber force.

The apparent failure of the use of the aircraft as a bomber, convinced senior officers of the army and navy that the future of the aeroplane lay in close support of land and sea operations. But the Allied bombing raids which had commenced as early as September 1914 when aircraft of the RNAS had attacked airship sheds at Düsseldorf and Cologne, and culminated in the tentative efforts of the Independent Air Force, led believers in the future of air power to other conclusions. Coupled to this, and frequently overlooked by the non-believers, was the effect that had been achieved on civilians by the bombing of London by the Imperial German Air Force. This was highlighted by General Smuts who stated in his previously mentioned report, 'Air power can be used as an independent means of war operations. Nobody that witnessed the attack on London on 11 July 1917 could have any doubt on that point. Unlike artillery, an air fleet can conduct extensive operations far from, and independent of, both army and navy. As far as can at present be foreseen there is absolutely no limit to the scale of its future independent war use. And the day may not be far off when aerial operations with their devastation of enemy lands and destructions of industrial and populous centres on a vast scale may become the principal operations of war, to which the older forms of military operations may become secondary and subordinate.'

1. Fairey Battle of either No. 103 or No. 105 Sqn, France, 1939. The aircraft is being loaded and armed for an armed reconnaissance flight.

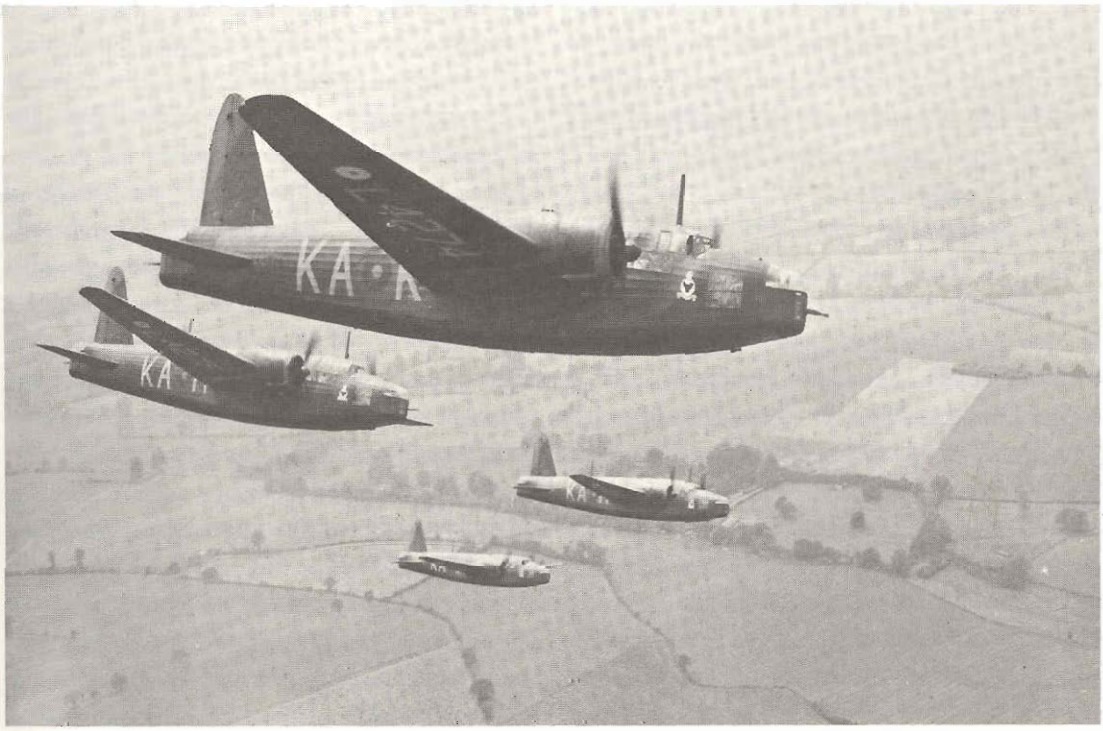
To some, these words may have appeared to be over-dramatic day dreaming, but to those civilians who had suffered and realized that defence against the German bombers and Zeppelins had been virtually non-existent, they held a chilling prophesy.

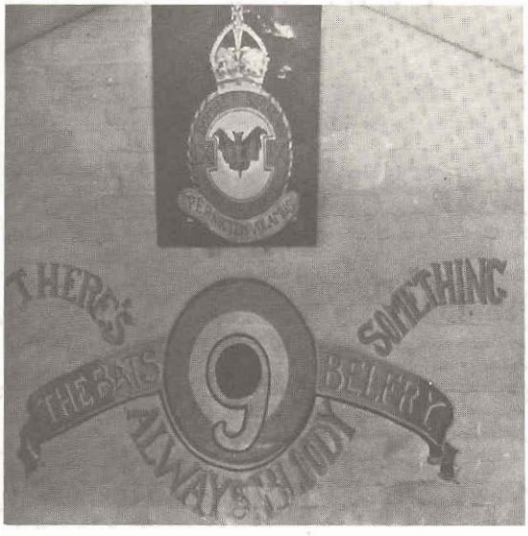
The British people had long regarded their island home as an impregnable fortress whose defence was secure in the hands of a strong Royal Navy; war was something that happened in other countries and was the concern of the army and navy; not since the days of the Norman invasion had the non-military members of the population been involved in war in their own land with foreign armies. But now the German attacks on London and other cities shocked them into a realization that they could become as involved as the innocent merchant seaman whose ship might well be torpedoed by a U-boat.

However, time is a great healer, so when the war ended in 1918 and the armed forces, especially the RAF were slashed to mere shadows of their former selves, the fear and anger were forgotten; not only by the man-in-the-street but also by the politicians. Within months of the end of the war, the RAF had been reduced from the strength of 188 combat squadrons to 33, and was involved in a political struggle over its very existence. The army and navy were firmly convinced that the formation of an independent air force had been only a wartime expediency, and peace would bring a re-organization that would once again give them control of their own air forces. But the War Office and Admiralty, who had never appreciated the power of concentrated attack, pursued independent lines which were doomed to failure; whereas, if they had buried their differences and presented a combined case, they might well have won the day. Meanwhile, under the leadership of the Chief of the Air Staff, Sir Hugh Trenchard, a peacetime RAF gradually took shape.

New equipment was hard to come by; in 1922 the defence budget for the Royal Air Force was at the all time low of £10,895,000. This reflected the low priority placed on the aerial defence of Great Britain. Despite the many problems with which he was faced, Trenchard managed to formulate a training programme that was to provide the

2. Wellington Mk I bombers of No. 9 Sqn – the first to receive the type – on a pre-war exercise; note squadron badge beneath cockpit.





3. The official badge of No. 9 Sqn, with a very unofficial motto added, on a crew room wall at Honnington. (via R. L. Ward)

foundations on which a strong RAF could be built. The self-perpetuating Ten Year Rule (which was a wholly arbitrary assumption by the government that there would be no war for ten years from any given date), and indifferent political leadership resulted in an air force that was sometimes regarded as a flying club for gentlemen and a means of providing thrills at flying displays. By 1925 the serious shortcomings of the RAF, who were still flying relics from the 1914–18 war, or at best slightly improved versions of such aircraft, was realized by the government and plans were made to strengthen it.

The provision of a bomber force was a vital element of Trenchard's plans, but it was argued that, although intended as a deterrent to potential aggressors, such a force could be interpreted as a means of offence, whereas the presence of a strong fighter force could only be regarded as defensive. The establishment of a deterrent was deferred in practice although on paper the intention was to establish a total of 52 squadrons of which 35 would be bombers.

The major threat to Britain at this time appeared to be France, whose air force was also expanding and was within easy striking distance of the British Isles, but the extremely remote possibility of the French becoming an enemy removed the urgency from the development of a long-range strategic bomber, although the light bombers that did exist were domiciled on airfields in the southern counties to put them within range of French targets.

On 1 January 1925 the new Air Defence of Great Britain under the command of Air Marshal Sir John Salmond came into being with a planned build-up of five years. By mid-1926 the ADGB had been organized into the Wessex Bombing Area which comprised regular bomber squadrons, and the Fighting Area which consisted of fighter squadrons; these two were supplemented by No. 1 Air Defence Group which included the Auxiliary Air Force Squadrons and Special Reserve Squadrons. Over the following years the RAF gradually expanded and the air estimates of 1931 reached a peak of £18,100,000, but in terms of equipment it was still a poorly armed force.

In July 1934 the Prime Minister, Mr Stanley Baldwin, who in a Commons statement in 1932 had stated that 'there is no power on earth that can protect him [the man-in-the-street] from bombing, whatever people might tell him. The bomber will always get through . . .', announced the government's intention to increase the RAF's first-line strength to 128 squadrons; thus began the long deferred expansion. The following March, Germany revealed to the world the existence of the Luftwaffe and announced that by 1937 it would be as strong as the French Air Force, which at that time was over 1,500 front-line aircraft, so a target of 1,512 aircraft was set for the RAF. The expansion programme saw the defence estimates soar to a staggering £73,501,000 by 1938, underlining the new sense of urgency that brought with it development of the Whitley, Hampden, Wellington and Blenheim.

During the expansion programme the home defence force, until now known as the ADGB, was reorganized into separate commands, so on 14 July 1936 Bomber, Fighter, Coastal and Training Command came into being. In 1937 the Whitley and Blenheim entered squadron service, and the following year they were joined by the Wellington and Hampden; at long last the RAF had a modern long-

4. Three crewmen of Wellington T2835, AA-C of No. 75 (New Zealand) Sqn; note Irvin jackets, and the air gunner's brevet and early pattern helmet of the sergeant on the left. (Author's collection)

range bomber force which was considered to be equal to any that existed anywhere. These four aircraft were to carry the brunt of the efforts made by Bomber Command during the opening years of the war, but already the Air Staff had created a requirement for their successors, which resulted in the Stirling, Lancaster and Halifax and these provided the backbone of the true strategic bomber force from 1942 until the end of the war.

The Munich agreement of 1938 gave much-needed breathing space to the RAF, who would have been hard-pressed to fight an air war on a serious scale at that time, but the year gained was hardly adequate for Bomber Command; when war finally came in September 1939, its strength of 55 squadrons was illusory, for there were hardly any reserves and no serious operational training had been undertaken. The bomber had been considered as a weapon for daylight use and its defensive armament of machine guns in fixed mountings or manually operated turrets was thought to be quite adequate, especially if the concentrated power from a formation of bombers was brought to bear on intercepting fighters. Specialist navigators were virtually unknown, the responsibility of aerial navigation falling on the shoulders of the pilot, and night navigation was an undeveloped art; other crewmen were recruited from airmen who might, or might not, show an aptitude for their chosen task.

On 1 September 1939 Germany invaded Poland and Warsaw was bombed; the army, navy and air force were mobilized, and the French and British Governments demanded German withdrawal from Poland. The following day 10 squadrons of Fairey Battles, forming the first echelon of the Advanced Air Striking Force, flew to Rheims where they immediately armed with bombs that had been stored there under the guise of being sold to the French. By mid-morning of the next day, Britain declared war on Germany. The theory of bombing was about to be put into practice, and Bomber Command was soon to learn some very costly lessons.

THE SHACKLED DETERRENT

At the outbreak of war Bomber Command was organized into six groups under the overall command of Air Marshal Sir Edgar Ludlow-Hewitt; five of these were operational and the sixth was a training group. No. 1 Group provided the ten Battle squadrons which formed the first echelon of the AASF which was dispatched to France on 2 September 1939. No. 2 Group, whose Battle squadrons were transferred to No. 6 Group (Training), comprised six squadrons equipped with Blenheim IVs. Based in East Anglia was No. 3 Group whose six squadrons had Wellington 1 and 1As. Yorkshire was the home of the five Whitley squadrons of No. 4 Group, whilst the six squadrons of Hampdens which comprised No. 5 Group operated from Lincolnshire.

This was set up by the end of September, when the original 55 squadrons had been trimmed to the twenty-three mentioned above plus the ten Battle squadrons of the AASF; the total strength of aircraft available was 480 of which only the Hampdens, Whitleys and Wellingtons had the range to carry out true strategic bombing from British bases, leaving the Blenheims for tactical bombing. The move of the Battles to France was aimed at putting strategic targets in the Ruhr within range in the

5. Rear turret and rear gunner of T2835; Feltwell, 1940. (Author's collection)

event of similar attacks being mounted by the Luftwaffe.

Bomber Command had no illusions about their ability to mount accurate precision-bombing raids by night, so most of their directives were based on the daylight use of the force available, the notable exception being the No. 4 Group Whitleys, whose slow speed was considered to make them too vulnerable for such operations.

During the opening days of the war President Roosevelt of the United States appealed to the countries involved not to undertake unrestricted bombing, and France made a request to the British Government that land targets in Germany should not be attacked, as, in the event of retaliation, she was likely to suffer the most. Concern for France's vulnerability was reflected in the attitude of the British Government, who did not wish to use the RAF in a way that would provoke German retaliation, so air operations were restricted to defensive patrols and attacks on German warships at sea. This cautious approach enabled Bomber Command to conserve and build up its strength and gave them the opportunity of putting into practice some of their peacetime theories.

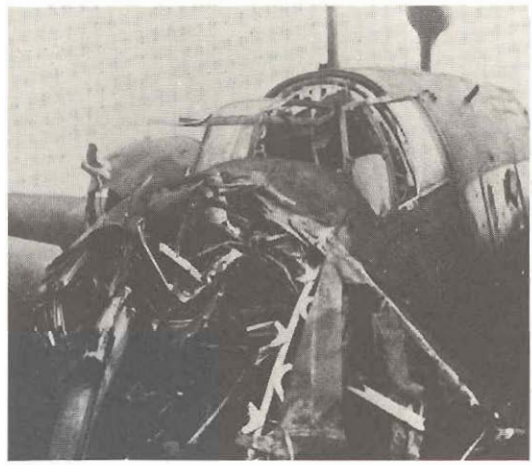
Within an hour of the declaration of war, a Blenheim IV N6215 of No. 139 Squadron left its base, Wyton in Huntingdonshire, to see if elements of the German fleet known to have been in Wilhelmshaven the previous day were still there. Piloted by Flg. Off. A. McPherson with Cdr. Thompson RN as the observer and Cpl. Arrowsmith as the air gunner, the Blenheim climbed to 24,000 ft and winged a lonely path towards the unknown enemy, becoming the first RAF aircraft to enter enemy airspace. The Blenheim's crew observed several warships moving into the Schillig Roads but the aircraft's radio equipment froze in the intense cold and they had to return to Wyton before they could pass their observations to the waiting striking force. By the time this had been done it was too late for operations to be mounted that day, so the reconnaissance was repeated the following morning, and again a two-hour delay occurred when the radio transmitter failed to operate. But this time it was possible to mount a strike and fifteen Blenheims of Nos. 107, 110 and 139 Squadrons – after changing their bombs for the fourth time during the two days they had been standing by – took off to attack the enemy fleet.

Led by Flt. Lt. K. C. Doran of No. 110 Squadron flying Blenheim IV N6204, the formation attacked in a shallow dive, catching the German ships, which included the *Admiral Von Scheer*, unawares. It did not take long for the German crews to organize their defence and soon the Blenheims were flying through a hail of anti-aircraft fire which accounted for three of No. 107's machines and one of No. 110's. One of the crashing Blenheims flew into the cruiser *Emden*, and this tragedy caused more damage than any of the eleven-second delay fused 500 lb bombs,

which simply bounced off the armoured decks of the German warships. Five of the attacking force failed to return and the aircraft of No. 139 Squadron never found their target, so Bomber Command's first operation can hardly be classified a resounding success. For his leadership on this raid Flt. Lt. Doran was awarded one of the first decorations of World War II, when he received the DFC which was gazetted at the same time as a similar award made to Flg. Off. McPherson, the pilot who had flown the reconnaissance Blenheim on 2 September.

On the same day, Wellingtons of Nos. 9 and 149 Squadrons also attacked shipping at Brunsbuttel, the entrance to the Keil Canal, but bad weather and reluctance to fly over the German mainland (which they had been briefed to avoid), coupled with heavy anti-aircraft fire, caused them to retreat in complete disarray, with a loss of two of their force of fourteen, and only one crew claiming to have gained a possible hit. This somewhat disconcerting result could be considered successful if compared with the efforts of six Hampdens of No. 83 Squadron, each with a 2,000-lb bomb-load, who set out from Scampton in the late afternoon of 4 September to attack shipping. Some of the pilots had never taken off with a bombed-up Hampden and at the briefing they were told how to ease the aircraft off the ground by judicious use of the tail trim tabs, or, if this failed, the use of the emergency boost override. In the event all aircraft safely accomplished the hazardous take-off and set course for the target area. Bad weather closed in over the formation and after ninety minutes flying, arguments between pilots and navigators as to their exact position rapidly developed; these were as rapidly resolved when flak bursts left them in no doubt as to where they were. But at about this time they were recalled to base and ordered to jettison their bombs into the sea.

Obsolete and incorrectly fused bombs, poor navigation, radios that didn't work and bad weather, all contributed to a dismal first day of war for Bomber Command, as well as highlighting some of the major problems that had to be overcome in the coming months. Lessons learned the hard way – by flying over heavily armed shipping bases, plus the wish to avoid inadvertent bombing of shore installations which might cause civilian casualties – caused a change in tactics which resulted in a directive that only ships at sea were to be bombed.



6. The sturdy construction of the Wellington shown to advantage in this snapshot of a Mk Ic, AA-B of No. 75 (NZ) Sqn which crash-landed after an air test at Feltwell in 1940. (Author's collection)

New problems were immediately created since, by the time reconnaissance aircraft had located enemy shipping and reported its position, a delay of anything up to four hours could occur before a strike was mounted; this delay, especially if the reconnaissance aircraft had been seen, gave adequate time for the ships to return to base or prepare their defences. Armed reconnaissance sweeps, in which the aircraft carried bombs enabling them to attack on sight, were therefore introduced. On 29 September, Hampdens of No. 144 Squadron based at Hemswell were presented with an opportunity to test the new theory of armed reconnaissance when they set out to look for enemy shipping off Heligoland. The aircraft left Hemswell in two sections; one consisting of five aircraft was led by Wg. Cmdr. J. C. Cunningham, the squadron C.O., and the other, which numbered six aircraft, was led by Sqn. Ldr. W. J. H. Lindley. Cunningham's section took off at 1650 hrs and was never seen again, all five aircraft falling victim to Luftwaffe fighters based on the Frisian Islands. Lindley's aircraft had more success, locating two enemy destroyers steaming at 20 knots in line astern. They attacked from 300 ft, but the defensive screen put

7. Observer and two gunners of a Wellington check their navigation bag before a mission. Note clip-on parachute pack, Sidcot suit, and the unusual flying suit with a 'woolly' texture worn by gunner on right.

up by the destroyers and their manoeuvres were far too effective, and only three of the Hampdens managed to attack, without causing any apparent damage. All six aircraft of this section returned safely but at a loss of more than 45 per cent of the attacking force was a high and unacceptable price that Bomber Command could not afford to pay.

During October and November, the Command retired to lick its wounds and reflect on its shortcomings. One event which occurred in October was to have far-reaching consequences as far as the Command was concerned; this was the establishment of the Empire Air Training Scheme in which Canada, Rhodesia, New Zealand and Australia were to co-operate. The purpose of the scheme was to train aircrew members in countries where the wide-open spaces and skies free from enemy interference enabled uninterrupted training of all categories of aircrew. By 1945, over 137,000 air crew had passed through the E.A.T.S. schools, and a high proportion of these served with Bomber Command from 1942 onwards. But in 1939 this was all in the future; a future which at that time looked rather bleak and unproductive as far as the bomber crews were concerned.

The lack of success in achieving any major victory over the German Navy caused the First Lord of the Admiralty, Winston Churchill, much embarrassment as British shipping losses cause by U-boats and mines continued to mount. Mindful of the growing impatience, but acutely aware of the fact that early experiences had shown his bomber crews to be lacking in battle expertise, navigation, and defence against fighters, Ludlow-Hewitt nevertheless ordered his squadrons to take advantage of any good weather to attack enemy ships in open waters or approaching port. Throughout November many attempts were made to carry out this directive, but they only succeeded in further highlighting the navigational problems that were already well known.

On one occasion in November a force of 48 Hampdens led by Wg. Cmdr. J. Sheen of No. 49 Squadron mounted what was to have been the biggest air strike of the war so far, against the German pocket battleship *Deutschland* which had been reported heading for open water south of Stavanger. Strong tail winds enabled the force to reach the target area in just two hours, but there was no sign of their quarry and after a fruitless search the force turned for home. The winds which had been their ally on the way out were now their enemy. As flying time increased and fuel reached critical states there was no sign of home and many crews thought they had missed the northern tip of Scotland and were heading for a watery grave in the Atlantic. Sheen's navigator continually checked his calculations and insisted that his dead reckoning position, which indicated that they were still over the North Sea, was correct. The absence of inter-aircraft radio meant that Sheen's other crews were completely unaware of the situation and they could only follow their leader despite any alternative suggestions put forward by their own navigators.

8. The slim rear fuselage of the Hampden shown clearly in this shot of P1316 of No. 14 O.T.U. at Cottesmore.

Signalling between aircraft was carried out with an Aldis Lamp or Very signals, and after ten hours flying Sheen used the latter method of communication to indicate that aircraft should continue to head south-east and land at the first airfield they saw. Eventually, the heading produced by Sheen's navigator proved to be correct, and with guidance from a trawler who exchanged lamp signals with the Hampdens, the force reached the Royal Naval air station at Montrose. One Hampden crashed on approach when its fuel ran out but the crew survived, so the abortive strike was not as costly as was feared at Bomber Command headquarters, where Ludlow-Hewitt and his staff were convinced that an unprecedented tragedy had overtaken the force during the ten hours of silent absence. Navigational errors had already caused the loss of several bombers, and such errors were to continue until the advent of the fully trained specialist navigator, many of whom were at that time about to embark on their courses under the Empire Air Training Scheme.

In December Bomber Command experienced two extremes: a success which led to a partial belief that their policy was vindicated, then a disaster which deflated the elation and brought in its wake a complete change of policy. On 3 December a force of 24 Wellingtons from Nos. 38, 115 and 149 Squadrons made a high-altitude attack on enemy warships off Wilhelmshaven. Despite heavy flak and interference from fighters, the Wellingtons sank one minesweeper and destroyed a fighter without loss to themselves, which seemingly proved the effectiveness of collective fire-power from a tight bomber-formation. This modest success was taken as confirmation that heavy bombers could operate safely without escort by daylight, and even when six of a formation of twelve Wellingtons were lost on 14 December during a further shipping strike against the cruisers *Nurnberg* and *Leipzig* in the Schillig Roads, this belief was not shattered as the 50 per cent loss was attributed to anti-aircraft fire. But on 18 December the picture was to change dramatically. A force of 22 Wellingtons from Nos. 9, 37 and 149 Squadrons returned to the area, confident that their tight formation and .303 Browning machine guns would see them through.

Unknown to British intelligence, the Luftwaffe was using a form of early-warning radar which had alerted Bf109s and Bf110s of II/JG77, III/JG77, 1/ZG76 and 10/JG26. The tight formation of bombers flew over the Schillig anchorage and Wilhelmshaven but did not drop any bombs, as the fleet they had set out to attack were in harbour and

9, 10. The result of a port undercarriage collapse suffered by Blenheim Mk I, L8500. (via R. L. Ward)

the risk of hitting civilian shore installations was too great. As the Wellingtons turned at 13,000 ft over Wilhelmshaven to head back towards the open sea, six Bf109s led by Lt. Johannes Steinhoff of 10/JG26 made contact. Almost immediately two of the bombers fell to the guns of the Bf109s, the first victory going to Hauptgefreiter Heilmayr and the second to Steinhoff. The anti-aircraft fire had helped to disperse the close formation and it very quickly became a case of every man for himself as far as the Wellington crews were concerned. The tail turret of the bomber packed a useful punch of four .303 Brownings but the German fighter pilots had learnt from their experiences of the 3rd and 14th as well as from a study of the firing arcs of a captured Wellington, and they avoided direct rear attacks, confining their efforts to beam attacks from above or simultaneous attacks from both rear quarters.

Lt. Helmut Lent of 1/ZG76 was delayed in taking off in his Bf110 but when he did get airborne he quickly overtook two Wellingtons which were trying a low-level escape; his first beam attack seemed to have little effect so Lent threw caution to the wind and attacked from the rear. He quickly silenced the rear gunner of one aircraft, then dispatched it with his cannons and machine guns; the Wellington made a forced landing on the island of Borkum. The Bf110 pilot then gave chase to the second Wellington which by now was very low, and a beam attack sent it crashing into the sea. Despite two victories in less than five minutes, Lent was not content, and five minutes later he achieved his third when he shot down an already damaged bomber. Another Bf110 pilot, Lt. Uellenbeck also chased two Wellingtons out to sea and although he accounted for one, the other's rear gunner badly damaged the Bf110 as well as wounding Uellenbeck, who was forced to make an emergency landing at Jever. A similar fate befell Hauptmann Wolfgang Falck, who scored two victories in ten minutes but received serious damage to his Bf110 and had to make a dead-stick landing. Lt. Fuhrmann in a Bf109 was not so lucky; after making three unsuccessful beam attacks he tried a straight rear approach and was immediately shot down by his intended victim's rear gunner. The Wellingtons caught fire easily because of fuel leaking from split wing tanks which were not of the self-sealing variety, a modification that was not long in coming after the events of the 18th.

Of the twenty-two Wellingtons which set out, ten fell to the guns of the German fighters, two more ditched on the way home and three succumbed to force landings. Two enemy fighters had been destroyed but against the loss of fifteen bombers, this was a small and acceptable price for the Luftwaffe to pay.

An interesting sequel to this disastrous raid is reported by Cajus Bekker in his book *The Luftwaffe War Diaries*, which records that the Wellington which crashed on Borkum did not in fact have any bombs on board, and the sole survivor, Flg. Off. Wimberley, claimed that the aircraft were on an unarmed navigation exercise training new pilots and observers. This story has never been con-

firmed, but seems unlikely, although why Wimberley's Wellington should have had no bombs on board is a mystery – unless, of course, he jettisoned them during combat; but it seems unlikely that he would have had time to retract his bomb doors.

The lessons learned by the British in this debacle altered the whole course of bombing policy; whereas previously it had been considered that beam attacks would be the most ineffective owing to the deflection involved, it was now realized that bombers were vulnerable to these and that collective fire-power from a massed formation was no defence against agile fighters, and self-sealing tanks became a must. The latter received top priority and by the spring of 1940 all bombers were equipped with them. But the most important lesson was that aircraft such as the Wellington, Hampden and Blenheim were unsuited for daylight operations and the bomber offensive would have to be undertaken under cover of darkness. Since the first night of the war Whitleys of No. 4 Group, which had been considered too slow for daylight operations, had been carrying out leaflet raids over Germany, the first of these being carried out by crews of Nos. 51 and 58 Squadrons. The crews were very sceptical about dropping millions of printed propaganda sheets aimed at lowering the morale of the civilian population, and after the war Bomber Command's most famous commander, Air Marshal Sir Arthur Harris, confirmed this scepticism when he commented that the only practical use these raids had achieved was to supply the enemy with toilet paper. But in retrospect this is not a particularly fair comment, for these early long-range sorties did give valuable navigation practice and experience of long night flights, as well as useful information about the location of anti-aircraft defences, decoy targets and enemy installations.

The conditions suffered by the Whitley crews were extremely trying; temperatures fell as low as −30°C at 15,000 ft, causing severe icing both inside and outside the aircraft, and on more than one occasion crew members returned suffering from severe frostbite as the aircraft's primitive heating system was not able to cope with such extremes.

11. The cramped crew accommodation of a Blenheim Mk I; the pilot sat on the left, and the bomb aimer lay in the tunnel beside him to sight and release the load.

12. The groundcrew of Hampden AE238, EA-P of No. 49 Sqn; RAF Scampton, 1941. Note aircraft insignia, illustrated in colour on p. 31 (via R. L. Ward)

Losses of 6 per cent were common at this time and did not justify the results being obtained but most of the losses were caused by faulty navigation and weather rather than by enemy action. In early 1940 Hampdens and Wellingtons joined the Whitleys in leaflet raids, which were code-named Operation *Nickel*, but it was not until March that bombs were dropped on land targets. In the meantime, the bombers of the Advanced Air Striking Force in France were having as difficult a time as their home-based companions, during what has become known as 'The Phoney War'.

INTERLUDE IN FRANCE

The ten squadrons of single-engined Battle aircraft which formed the initial element of the AASF were armed and fuelled ready for operations when Prime Minister Neville Chamberlain announced that Britain was at war with Germany. By prior arrangement with the French, these aircraft had flown, the day before war was declared, to bases in the Champagne district where stores of bombs and fuel had been laid in for them. The forward bases in the Rheims area placed the Battles within easy range of industrial targets in Germany, but fear of reprisals on French targets had confined the aircraft to reconnaissance duties along the Franco-German border.

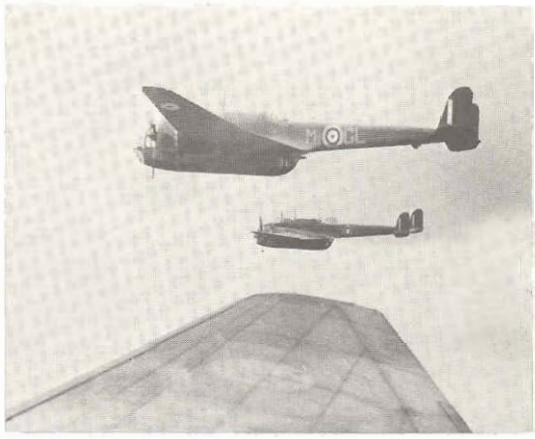
Even by the standards of 1939, the Battle was an obsolete aircraft which was hopelessly outpaced by the Bf109, and its single rear-firing machine gun afforded little protection against the German fighter. On 20 September three Battles of No. 88 Squadron took off from their base at Moumelon-le-Grand to carry out a reconnaissance just over the border, and were bounced by Bf109s. Two Battles were shot down but the third returned to base after a running fight in which Sgt. F. Letchford, the air gunner, shot down one of the pursuing fighters – the first air combat victim of the RAF in World War II. Nine days later, five Battles of No. 150 Squadron operating from Ecury-sur-Coole also encountered Bf109s and the resulting fight, which lasted for thirty-five minutes, put comparison between the types into true perspective. Attacking in zooming climbs from beneath the Battles, the Bf109s soon accounted for four of the bombers, whilst the fifth flown by Sqn. Ldr. W. M. L. Macdonald tried a diving, jinking run towards safety. Macdonald's air gunner accounted for one Bf109 and another was seen to be trailing smoke, but the Battle was badly damaged and the navigator wounded. Soon after crossing the French border, the bomber's engine failed and Macdonald was forced to land; the

13. Two Blenheim Mk IVs of No. 40 Sqn ready for take-off at Wyton in July 1940. Light bomb carriers are mounted externally behind the bomb bay; the rear aircraft has the ventral nose turret for two ·303 guns.

aircraft somersaulted and caught fire, becoming a total write-off. So, with a loss of a complete flight, it was not surprising that reconnaissance operations were temporarily halted. During this interlude various attempts were made to improve the Battle's defensive armament, and one of these was the fitting of a downward firing gun but, as the crewman who operated it had to be something of a contortionist it was not a success.

The onset of the coldest winter for fifty years brought extremely difficult conditions for the squadrons in France; engines had to be run periodically through the long dark nights to prevent them freezing-up, and on several occasions even tins of anti-freeze defied their name and froze. When weather permitted, training flights consisting of gunnery over the sea and bombing on ranges took place, but there was generally a lack of purpose and, to prevent morale from sinking too low, reconnaissance sorties and leaflet raids were re-introduced. In December two of the Battle squadrons, Nos. 15 and 40, were withdrawn to England for re-equipment with Blenheims, and their place was taken by Nos. 114 and 139 Squadrons who were already flying this type of aircraft.

The arrival of the thaw in March/April made the landing fields into quagmires in which the clinging mud made operations as difficult as the extreme cold had done. On 10 May 1940 the lull in activity ended



14. Hampdens of No. 14 O.T.U. in flight, underline the reasons for the Hampden's nicknames of 'Flying Tadpole' and 'Flying Suitcase'.

as Germany attacked the Low Countries, and the AASF was soon in action. Despite the violation of their neighbours' borders, and strafing attacks of troop concentrations in France, the French still desperately clung to a hope that a bombing war could be avoided, and they persistently refused to let bombing aircraft operate from French airfields. The pleas for aerial support mounted and eventually the Commander-in-Chief of British Air Forces

15. Whitley Mk V, T4261, DY-S was presented to No. 102 Sqn by the Governor and people of Ceylon, and bore a suitable inscription below the nose turret. It was later lost on operations.

in France, Air Marshal A. S. Barratt, took matters into his own hands and ordered the AASF to mount strikes against enemy troop columns. As the vulnerable Battle could not be provided with a fighter escort, the crews were advised to make low-level approaches to their targets in the hope that the element of surprise would give them some form of protection. But by the end of the first day it was obvious that this ploy had failed as 13 of the 32 Battles sent into action failed to return. The Blenheim squadrons fared little better; the highest percentage loss was suffered by No. 18 Squadron which lost two out of three machines sent out on the opening day of the Blitzkreig. But more disastrous losses were just around the corner. On 11 May eight Battles from Nos. 88 and 218 Squadrons set out to attack a German troop column and only one returned. On the same day the Luftwaffe attacked No. 114 Squadron's base and wiped out practically every Blenheim.

In an attempt to slow down the German advance, orders were given on 12 May to attack the road bridges over the Albert Canal near Maastricht, which two days before had been in Allied hands and could easily have been destroyed by sappers without any loss of life. But in those two days the Germans had wasted no time in erecting their anti-aircraft guns. Belgian Air Force Battles had lost six of their number on 11 May when they attempted to bomb the bridges, so the cards were stacked very high against No. 12 Squadron, who were chosen to mount an attack on 12 May.

Every member of the squadron volunteered for this hazardous operation and, in view of this, the six crews whose names appeared as next in line for duty were selected. Two sections of three aircraft, led by Flg. Off. D. E. Garland and Flg. Off. N. M. Thomas, took off from their base at Amifontaine with orders for Garland's aircraft to attack the metal bridge at Veldwezelt and Thomas's to concentrate on the concrete one at Vroenhoven. One of Thomas's section failed to take off, so the attacking force was immediately reduced to five aircraft. Thomas and his number two, Plt. Off. T. D. Davy decided to attack from high level and on reaching their target commenced a diving attack through heavy flak from 6,000 ft. Both aircraft were hit several times and, soon after dropping his bombs, Thomas crashed and was taken prisoner. Meanwhile, Davy had also been having problems and was nearly destroyed in the burst of his own bombs; however, the battered Battle survived the attack and, after ordering his crew to bale out, Davy attempted to return to base but crashed before he got there. Garland, with Plt. Off. I. A. McIntosh as his number two and Sgt. Marland flying number three, made a low-level attack in line astern. McIntosh was hit almost at once and, jettisoning his bombs, he pancaked his aircraft near the bridge. Marland was hit as he climbed away and the Battle was seen to stall at about 100 ft, then crash. Garland succeeded in damaging the bridge but perished with his crew, as had Marland and his companions. For his gallantry in leading the three Battles, Flg. Off. Garland and his observer, Sgt. T. Gray, were awarded the Victoria Cross, becoming the first RAF personnel to receive this decoration in World War II.

In the two days since the German attack had begun the AASF's force of 135 Battles and Blenheims was reduced to 71 serviceable machines. Two days later the total force was called into action against the Sedan bridgehead, which on the morning of 14 May had been attacked by ten Battles of Nos. 103 and 150 Squadrons without loss. The afternoon assault was to bring entirely different results. Of the sixty-three Battles which took off, thirty-five failed to return, the highest loss being suffered by No. 218 Squadron who lost ten of the eleven aircraft they contributed. The Battles stood no chance against the Bf109s that were waiting for them and the French countryside was soon littered with the funeral pyres of the gallant RAF crews who had tried their best in aircraft that were entirely unsuitable for the task. In addition to the loss of thirty-five Battles, five of the eight Blenheims from Nos. 114 and 139 Squadrons were lost, bringing the total destroyed to forty out of an attacking force of seventy-one: a loss rate that was to be the highest sustained by the RAF throughout the war. On the evening of the same day twenty-eight Blenheims made a further attack on the German positions and

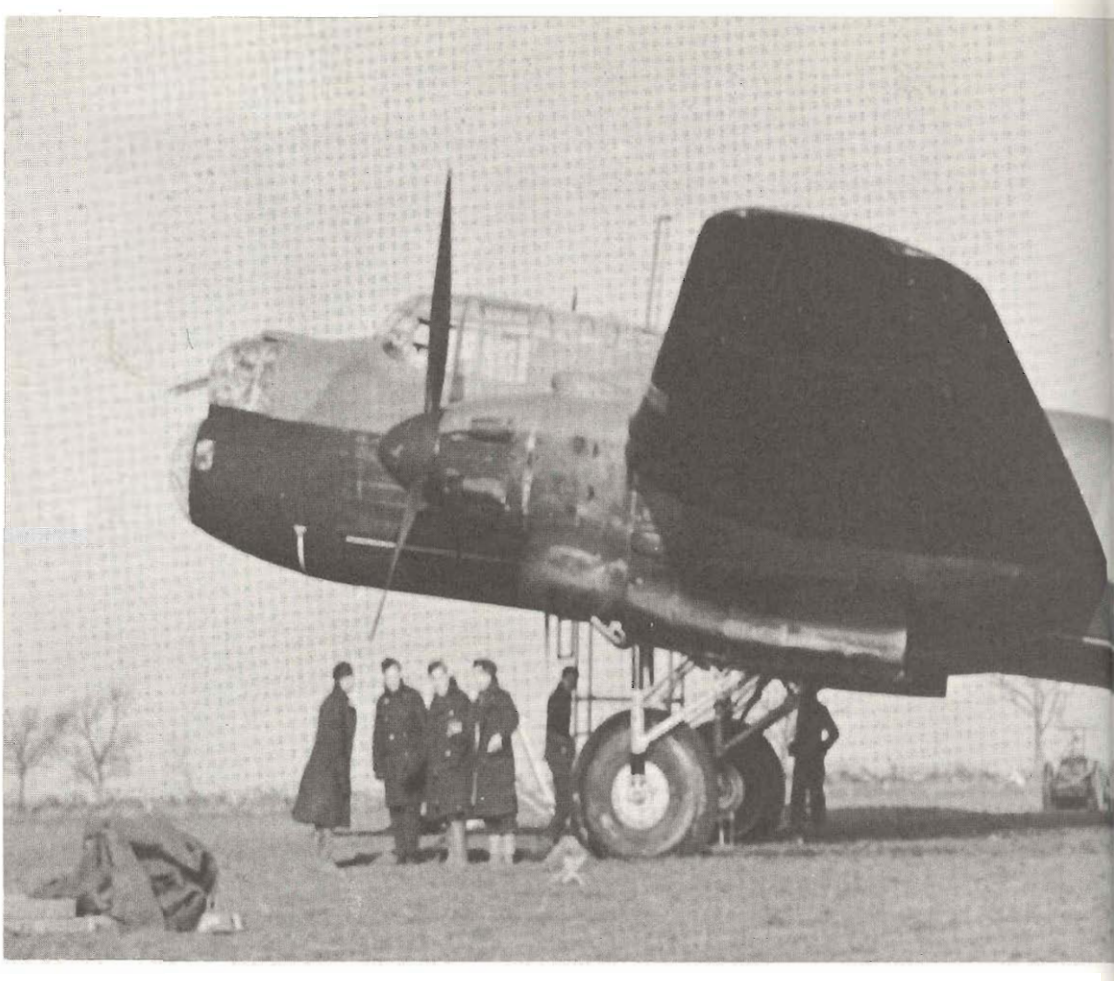
16. The ill-fated Manchester – here, a Mk Ia of No. 207 Sqn on air test before delivery.

lost seven of their number without achieving any major results or appreciably delaying the German advance.

During the next two days, what remained of the AASF withdrew south to bases around Troyes. Unserviceable aircraft were destroyed to prevent their capture by the enemy, although what the Germans would have done with aircraft like the Battle or Blenheim must remain an unanswered question. Two Battle squadrons, Nos. 105 and 218, had only four aircraft left between them, so they were absorbed into other squadrons; similarly, the two remaining Blenheim squadrons, with a total of nine aircraft, were transferred to the reconnaissance wing of the Air Component of the British Expeditionary Force. The remaining squadrons of the AASF, which now totalled six Battle and three Hurricane units, continued to fight until mid-June when Air Marshal Barratt ordered them to return to England. During this period they operated mainly at night, although such operations usually resulted in bombs being dropped purely on an estimated time of arrival over the target, and were of no more than nuisance value.

The War Cabinet removed some of the restrictions they had placed on the bombing of targets east of the Rhine but the persistent reluctance of the French to allow long-range bombers to land and refuel on French soil before attacking distant targets, hampered these operations. Permission was gained, before the final collapse of France, to use their airfields, and Blenheims and Battles eventually took off from them to attack targets in Germany, focusing on communication systems and troop concentrations.

Also involved in these raids were home-based Whitley and Hampden squadrons, eight of the former making the first attack on the German mainland on the night of 10/11 May when they



bombed roads, railways, and bridges on the enemy's route to southern Holland. The following night a much larger force from Nos. 51, 58, 77 and 102 Squadrons, flying Whitleys, and Nos. 44, 49, 50, 61 and 144 Squadrons flying Hampdens raided the important railway complex at München-Gladbach. Of the thirty-six aircraft which set out, about half found and bombed the target or the area around it, and three aircraft – one Whitley and two Hampdens – failed to return.

On 15 May the War Cabinet finally authorized Bomber Command to extend its radius of operations, and that night a force of Wellingtons, Whitleys and Hampdens from Nos. 3, 4 and 5 Groups attacked railways, oil and steel plants in the Ruhr, thus opening the strategic bombing offensive which was to go on for another five years.

In June, Italy declared war on Britain and, less than twenty-four hours after she had done so, a force of 36 Whitleys from Nos. 10, 51, 58, 77 and 102 Squadrons set out to raid targets around Turin and Genoa, refuelling in the Channel Islands; the force encountered strong winds, heavy storms and severe icing over the Alps which forced twenty-three of their number to return without reaching the target area. Ten of the others successfully overcame the elements and bombed Turin, whilst two of the remaining three deposited their loads on Genoa; the third Whitley was not heard of after take off and became the only casualty of the raid. This force of Whitleys should have been supported by Wellingtons of No. 3 Group, but the twelve aircraft which had landed at Salon in the south of France were not allowed to take off by the French authorities, who did relent, however, on the night of 15/16 June when eight Wellingtons of Nos. 99 and 149 Squadrons used the airfield to refuel before attacking Genoa. Only one of these aircraft reached

17. Manchester Mk I, L7288 of No. 207 Sqn; note that the dorsal fin was deleted on the Mk Ia. This machine later passed to No. 61 Sqn at Hemswell, and then to a conversion unit where it survived until June 1942.

the target area and bombed, the rest returning with the loads intact. The next night Wellingtons again used Salon for the second and last time to attack Italy; this time their objective was industrial targets near Milan and Genoa. But even as the Wellingtons were being refuelled at Salon, the French were negotiating for an armistice, and on 18 June all RAF squadrons were evacuated from France.

The six-week campaign cost Bomber Command a total of 340 aircraft, and the practical annihilation of No. 1 Group's Battle squadrons; this figure represented just over one third of the total RAF losses during the French campaign. On the credit side, the RAF had accounted for over 1,000 German aircraft, and these must have been very much in Prime Minister Winston Churchill's mind when he summed up the Battle of France after Dunkirk, with the words 'there was a victory inside this deliverance which should be noted. It was gained by the Royal Air Force.' Bomber Command, now under its new Commander-in-Chief, Air Marshal Charles Portal, who was appointed on 3 April 1940, now stood alone as the only weapon with which the British could strike at Germany. The commencement of strategic bombing on 15 May 1940 marked the first use of this weapon, and for the next eighteen months Bomber Command was to lay the foundations of a force which, by 1945, had dropped over 955,000 tons of bombs.

UNDER COVER OF DARKNESS

From the opening night of the war Whitleys of No. 4 Group had been ranging far into Germany on leaflet raids, meeting little opposition from either enemy fighters or anti-aircraft defences, but none the less their loss rate was approaching 6 per cent (caused mainly by bad weather and faulty navigation). During this period many crews made blunders that in retrospect are almost unbelievable, but which serve to illustrate how poorly the pre-war Air Staff had visualized a night bomber offensive. One such incident occurred in March 1940, when Whitleys of No. 77 Squadron and Hampdens of No. 5 Group were dropping leaflets over Poland; during the second leaflet raid on this country a No. 77 Squadron aircraft, piloted by Flt. Lt. Tomlin, encountered severe head winds on its return flight to Villeneuve. After 11 hours flying, during which time most of the navigation had been done by dead reckoning, the state of the Whitley's fuel was becoming critical. According to the navigator's calculations the aircraft was over France, but, when the pilot selected a suitable field and landed, the astonished crew were surprised to hear that the language spoken by the civilian farm workers who came out to the Whitley was German. It was then that they realized the enormity of their error, and only just managed to restart the aircraft and take off before troops arrived.

Until May 1940 most of Bomber Command's activity was confined to armed reconnaissance patrols over seaplane bases around the islands of Sylt, Borkum and Norderney. These patrols had been inaugurated on 12 December and were fairly successful in their aim, which was to curtail the activity of mine-laying seaplanes. These patrols were flown by Whitleys until February 1940 when Hampdens of No. 5 Group joined them, so it is perhaps fitting that the first raid on a land target by British-based bombers should have been made by these two types. This raid, which took place on the night of 11/12 March, was on the seaplane base at Hörnum on the island of Sylt and the thirty Whitleys and twenty Hampdens which took part claimed to have hit several buildings, slipways and other installations. One Whitley failed to return so, on the evidence available from the crews, the raid had been a success, but photographic reconnaissance carried out the next day did not support the claims and it became obvious that night bombing was going to be far more difficult than everyone thought.

18. Merlin-engined Wellington Mk IIs of No. 214 Sqn. The nearest machine was a presentation aircraft bought from funds raised in the Federated Malay States and bears a tiger's-head badge beneath the cockpit on a white square, with the white-lettered legend SRI GUROH below. BU-V, W5442 was lost on operations.

19. 'Nose art' was fairly uncommon in the early war years: the groundcrew seem to approve the sentiments behind this example!

During the leaflet raids and armed sea-reconnaissance trips, there had been other diversions, such as the abortive attempts to stop the German invasions of Norway and France, none of which helped to uphold the promised potential of the Command. The loss rate in day bombing, which had reached ten times the rate the force could stand, plus the tragic proof that tightly packed formations could not provide their own defence, and the final abandonment of policies which were based on long-held theories, meant that by the time Portal took over the Command in April 1940, he inherited a sterile force operating at night with paper missiles.

Portal's staff officers had no illusions about the efficiency of the force then at their disposal, as far as night bombing was concerned. Although it was generally believed that Bomber Command aircraft could bomb with an accuracy of only 300 yards in daylight, and such men as Air Vice Marshal Harris – then commanding No. 5 Group – had stated that by dead reckoning and the use of wireless telegraphy, a similar margin of error should also be possible at night, Portal's staff took a more realistic view that

under the very best conditions only half of the experienced bomber crews then available could positively identify and attack a target at night; and few inexperienced crews would even find it.

The Air Staff chose to listen to the arguments of those who championed precision bombing and they ordered Portal to concentrate on attacking enemy oil plants, aircraft factories and shipping; the only open targets where near misses might still achieve a measure of success were railway marshalling yards. Churchill turned towards Portal and Trenchard's philosophy, and then only after the Luftwaffe had bombed London on the evening of 24/25 August.

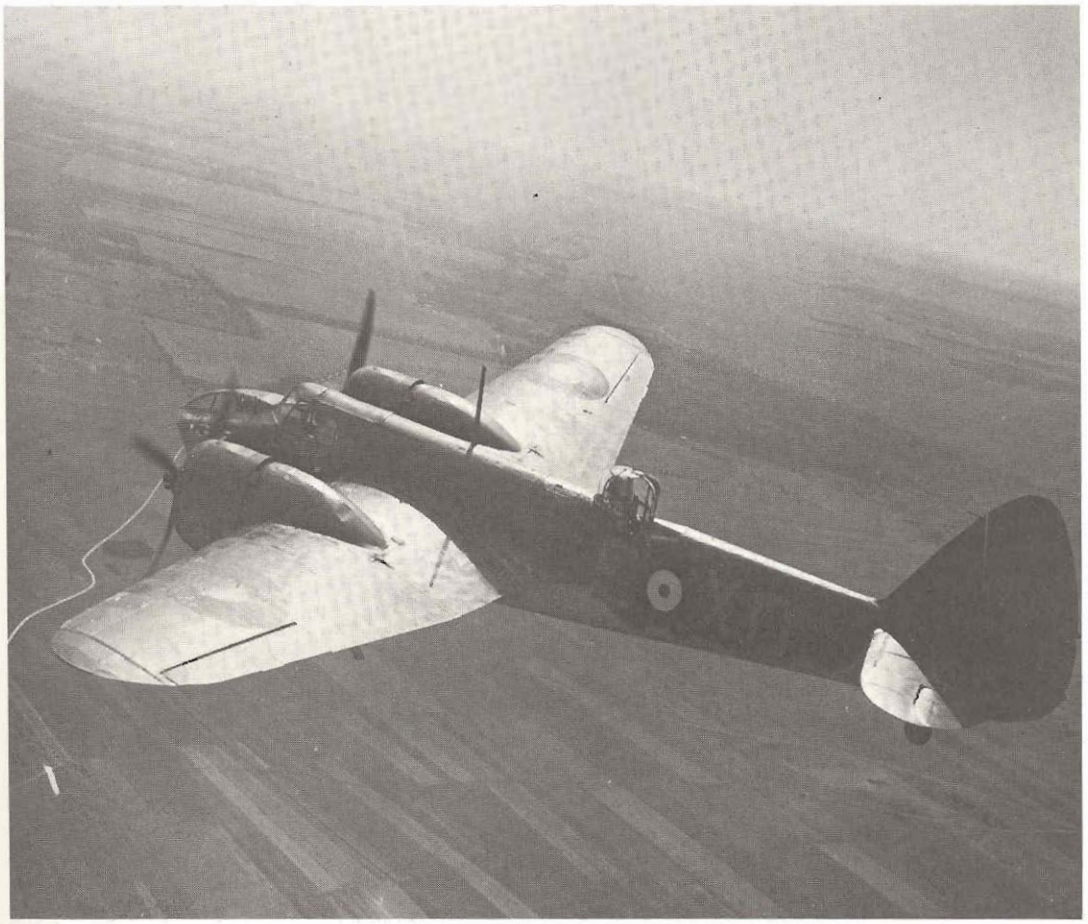
Between the fall of France and the introduction of area bombing – in a small way – Bomber Command was occupied with strikes against shipping, the ports from which Hitler hoped to mount his invasion of England, and military targets in occupied Europe. No. 2 Group's Blenheims mounted many successful shipping strikes which continued until October 1941 when increasing losses and a shortage of replacement Blenheims, as well as a switch in tactics, brought them to an end. By this time the Blenheims were being replaced by the American-built Boston and Ventura. During this period Wg. Cmdr. Hughie Edwards of No. 105 Squadron was awarded the Victoria Cross for his work in leading twelve aircraft of Nos. 105 and 107 Squadrons operating from Swanton Morley and Great Massingham, in a low-level raid against the

20. Whitley of No. 102 Sqn returning to base after a leaflet raid over Germany in 1939.

Portal's belief in area bombing, which involved destroying not only industry but also adjacent homes occupied by people who worked within the factory or plant, reflected Trenchard's own opinions, but the Air Staff decreed that the effect on morale of bombing civilians must be the secondary objective. It was not until August 1940 that

docks at Bremen. Before this, on 15 September 1940, 18-year-old Sgt. John Hannah, a wireless operator/air gunner of No. 83 Squadron had also received the ultimate gallantry award when his Hampden P1355 was set on fire during a raid on the invasion fleets gathered in Antwerp docks. The rear gunner and navigator evacuated the Hampden but Hannah quenched the flames first with two extinguishers, then with his log book, before passing all the navigator's maps and log-books to the pilot who successfully flew the severely damaged aircraft back to its base. The narrow confines of the Hampden's fuselage was one of its major drawbacks, especially as there was no way a crew member could reach the pilot and take over the controls should he be injured or killed, hardly a situation to promote good morale among crew members.

The strategic bombing which began in May continued against oil and railway targets as well as enemy airfields and communication systems. One of the latter that received a lot of attention from Bomber Command was the Dortmund–Ems canal which formed one of the main outlets to the sea of coal and other produce from the Ruhr. The canal was particularly vulnerable where it crossed the river Ems in two aqueducts, and the presence of heavy anti-aircraft batteries indicated that the Germans were aware of this vulnerability. Photographic reconnaissance at the end of July showed that the Command's efforts had not been in vain as one of the aqueducts was damaged and water in the canal was at a low level. On the night of 12/13 August ten Hampdens of Nos. 49 and 83 Squadrons left their base at Scampton in an attempt to administer the coup de grace to the remaining aqueduct. Five of the aircraft created a diversion by



21. Blenheim L8756, E-XD of No. 139 Sqn over France early in 1940.

22. Another view of No. 139 Sqn's Blenheim Mk IVs in French skies shortly before the violent ending of 'The Phoney War'.

attacking nearby lock gates and river craft whilst the other five concentrated on the main objective. The first two attacking aircraft were shot down and the other two badly hit, but the fifth, flown by Flt. Lt. Roderick Learoyd of No. 49 Squadron, approached at 150 ft and hit the objective. Learoyd's aircraft P4403 was severely damaged by flak which rendered the hydraulics unserviceable, but he managed to land when day broke. Learoyd was awarded the Victoria Cross and became the first member of Bomber Command to receive this decoration – Flg. Off. Garland and Sgt. Gray who had won it in May 1940 being part of the AASF.

Production of the Hampden, which had featured prominently in the two raids mentioned, ended in July 1940, which was the month in which an aircraft of this type, flown by Flg. Off. G. Gibson – later to become famous as the leader of No. 617 Squadron, 'The Dam Busters' – dropped the first 2,000 lb bomb to be used by Bomber Command. This was on the night of 1/2 July when No. 83 Squadron attacked the *Scharnhorst* which was lying in dry-dock at Keil; the 2,000 lb bomb missed the German battleship and landed in the centre of Keil where its unexpected arrival caused considerable alarm.

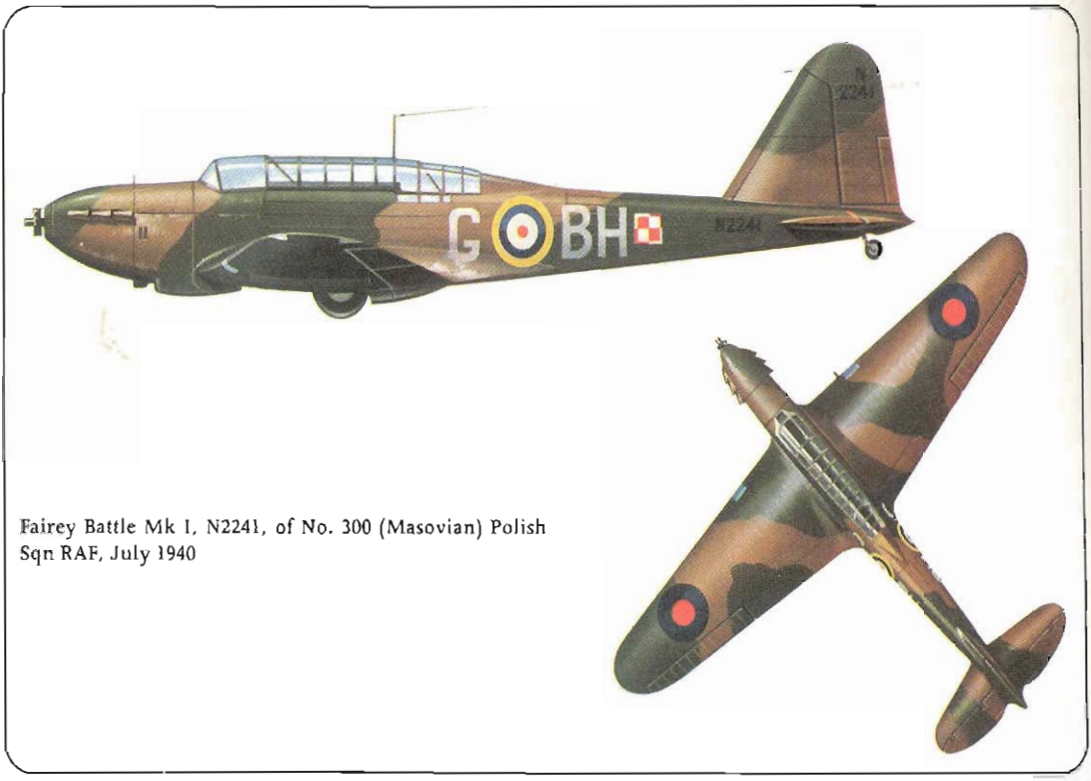
Just before the bombing of Berlin on 25/26 August, which was mounted as a reprisal for Luftwaffe attacks on London the night before, a notable event occurred. This was the arrival in squadron service of the first of the RAF's four-engined bombers, the Short Stirling, with No. 7 Squadron at Leeming. The Stirling had been planned

in 1936 when the growth of the Luftwaffe was well under way, but its performance, especially in reaching a high enough altitude, was disappointing. (The altitude problem was caused when Short's original proposal for a wing span of 112 ft was reduced by the Air Staff to 100 ft so that the aircraft could be accommodated in existing hangars!) Despite its shortcomings the aircraft operated alongside its higher flying cousins, the Lancaster and Halifax, during Bomber Command's years of triumph, although its loss rate was *pro rata* much higher. It is also interesting to note that the Stirling was the only one of the heavies to be planned as a four-engined bomber right from the start, the other two being originally planned as twin-engined machines.

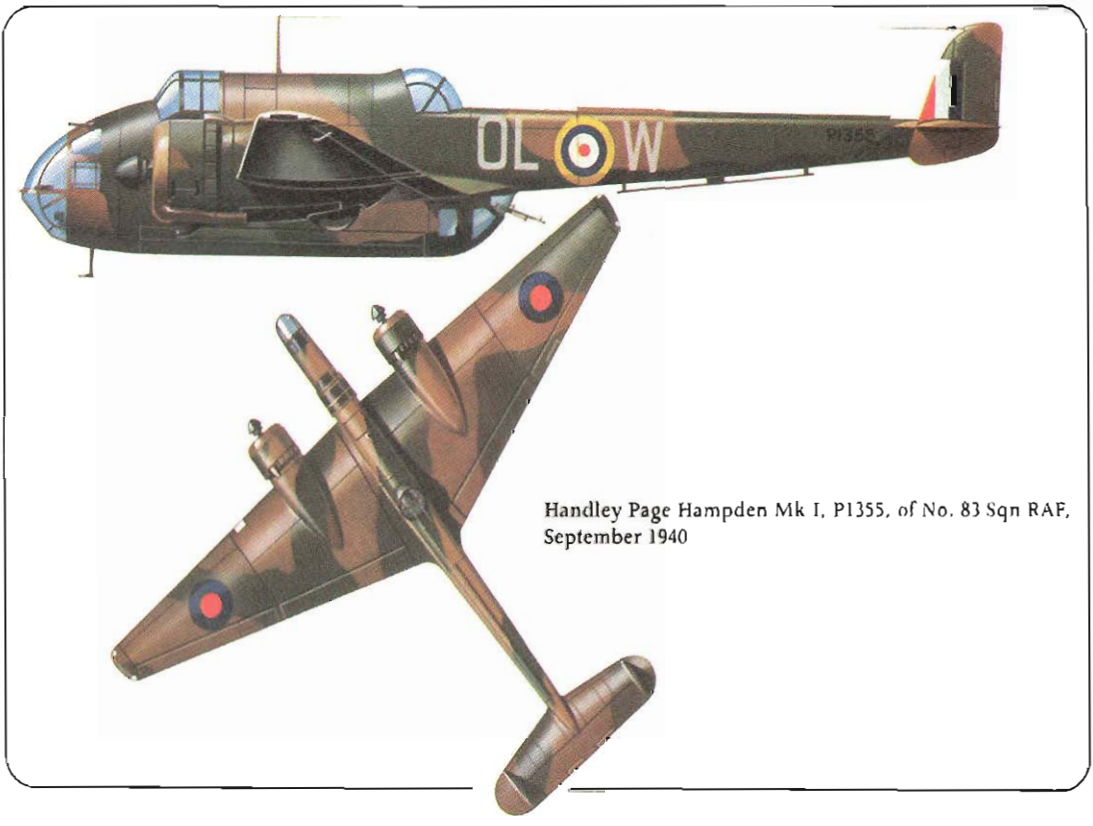
On the night of 25/26 August, however, the Stirling was still undergoing working-up exercises with No. 7 Squadron, so the aircraft that carried the bombing war to Berlin were the redoubtable Whitley, Wellington and Hampden. A force of eighty-one aircraft from Nos. 3, 4 and 5 Groups were briefed to attack the German capital, but cloud, which in places reached 10/10ths coverage, prevented all but twenty-nine of the force from dropping their bombs. Of the other fifty-two, twenty-seven claimed to have reached the target area but could not see their aiming point so returned with their loads; six of them jettisoning theirs over the sea on the return journey, eighteen selected alternative targets in Germany and the remaining seven aborted. Five of the aircraft which set out failed to return, but three of these ditched in the sea and the crews were subsequently rescued. The material damage was slight but German morale was affected for a while, especially as Göring's statement of July 1939, 'If any enemy bomber reaches German soil, my name is not Hermann Göring. You can call me Meier' was still fresh in their minds.

Throughout September most of the Command's efforts were directed at the build-up of the German invasion fleet, though sporadic night raids both with bombs and leaflets continued. In October Air Chief Marshal Sir Charles Portal became Chief of the Air Staff and his place as head of Bomber Command went to Air Marshal Sir Richard Pierse, who by the

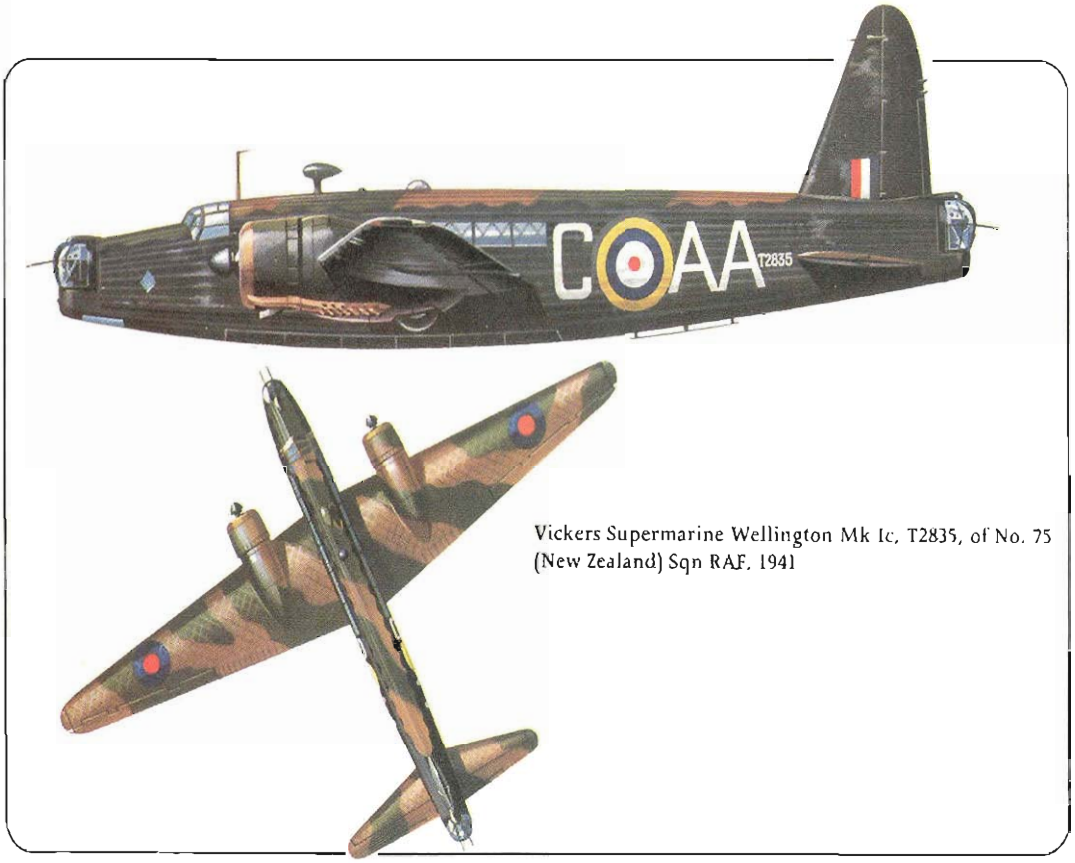
RAF Bomber Command pilot, 1940. He is equipped with the Type C general purpose flying helmet with zipped earphone housings and blue fabric-covered oxygen/microphone mask, and the flight jerkin incorporating an integral parachute harness. He carries his own and another crewman's parachute packs, which attached to snap-hooks on the jerkin by means of the D-rings. The elastics stretched around the pack pulled it open when the rip-handle in its stowage pocket was pulled. He wears an Irvin jacket and flying boots with suede legs over RAF service trousers, and a shirt and tie.



Fairey Battle Mk I, N2241, of No. 300 (Masovian) Polish Sqn RAF, July 1940



Handley Page Hampden Mk I, P1355, of No. 83 Sqn RAF, September 1940



Vickers Supermarine Wellington Mk Ic, T2835, of No. 75 (New Zealand) Sqn RAF, 1941

OPPOSITE, TOP: Fairey Battle Mk I, N2241 BH-G of No. 300 (Masovian) Sqn, the first Polish-manned bomber squadron in the RAF, which formed at Bramcote, Warwickshire on 1 July 1940. Most of the original crews were Polish-trained fighter pilots. The unit began operations in September 1940; it was later equipped with Wellingtons and eventually with Lancasters. Upper surfaces are finished in A Scheme camouflage of Dark Earth and Dark Green, under surfaces in night black. The 27 in. codes in light grey were marked G-BH on the port side, BH-G on the starboard; the Polish insignia appeared between the rear letter and the serial on both sides. Note serial repeated on rear fuselage and on tail. Roundels were 60 in. diameter Type B on wing upper surfaces, 60 in. diameter Type A1 on fuselage sides.

OPPOSITE, BOTTOM: Handley Page Hampden Mk I, P1355 OL-W of No. 83 Sqn, based at Scampton in September 1940. This is the aircraft in which Sgt. John Hannah, the WOp/Ag, won the Victoria Cross for his gallantry during a raid on Antwerp on 15/16 September. The 24 in. high light grey codes appeared as OL-W on port side and W-OL on starboard side. The 8 in. equal stripes of the fin flash were 24 in. high at the front, 27 in. at the rear. Roundels were 54 in. diameter Type B on upper wing surfaces, 36 in. Type A1 on fuselage sides.

ABOVE: Vickers Supermarine Wellington Mk Ic, T2835, AA-C of No. 75 (New Zealand) Sqn, based at Feltwell in 1941. The B Scheme camouflage of Dark Earth and Dark Green meets the black of the lower surfaces in a wavy line high on the fuselage sides. The white code letters are 54 in. high, and appear as AA-C on the starboard side. The fin flash is 27 in. high, composed of three equal 8 in. stripes. Type B roundels, 63 in. in diameter, appear on the upper wing surface, and 60 in. diameter Type A1 roundels on both fuselage sides. Some aircraft of No. 75 Sqn carried the 'soda syphon' insignia beneath the cockpit on the port side (see colour illustration on p. 31) but it is not known if 'C-Charlie' was one of these.

Armstrong Whitworth Whitley Mk V, Z9466, of No. 10 Operational Training Unit, RAF, May 1942

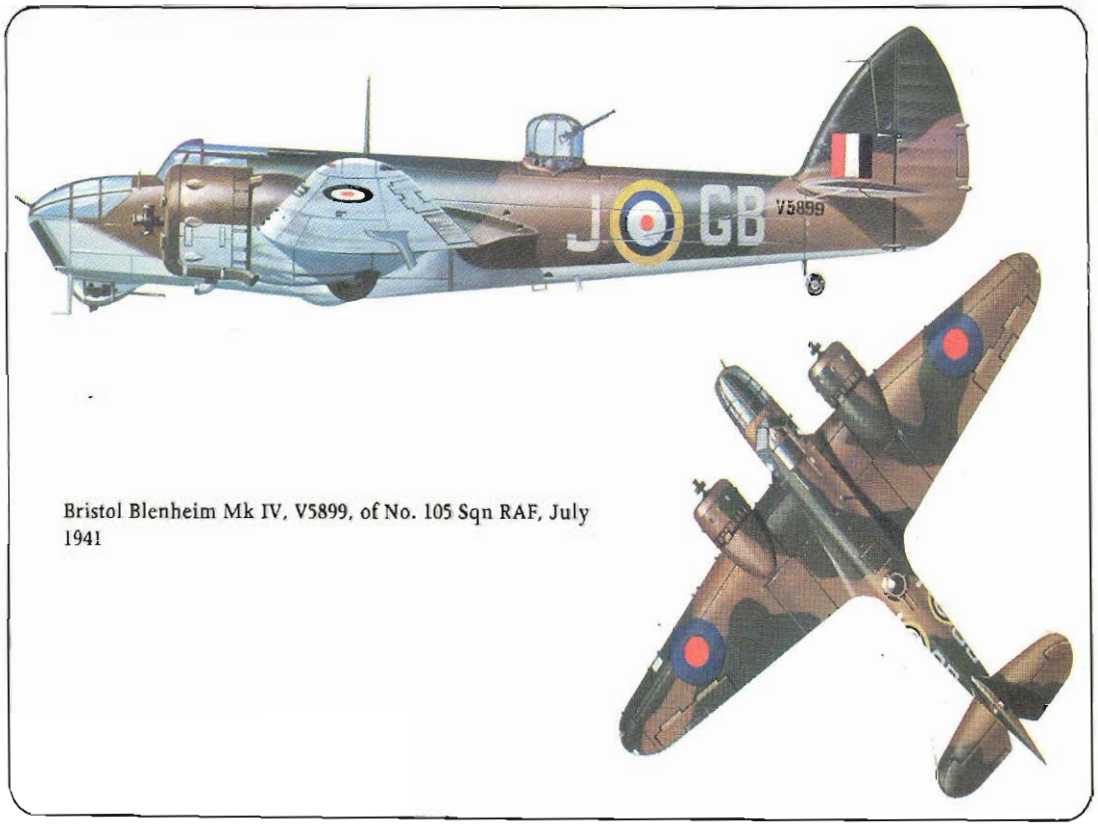

Z9466
Q
ZG

PAGES 28–29: Armstrong Whitworth Whitley Mk V, Z9466, ZG-Q of No. 10 O.T.U., based at Abingdon in May 1942. This machine was flown by a crew of instructors on the first 'Thousand-Bomber' raid to Cologne on 30/31 May 1942, and on the second, to Essen, on 1/2 June 1942. Flight time on the Cologne raid was 5 hours 10 minutes; the bomb load was six small bomb containers and two 500 lb HE General Purpose Mk IV. The pilot, Wt. Off. R.E. Griffin, DFM, had already completed 30 missions in Whitleys as a sergeant pilot with No. 10 Sqn before joining No. 10 O.T.U. in July 1941. The other crew members were: P. Off. Hool (navigator), Flt. Sgt. Taylor (bomb aimer), Flt. Sgt. Salt (WOp/Ag) and Sgt. Thomas (rear gunner).

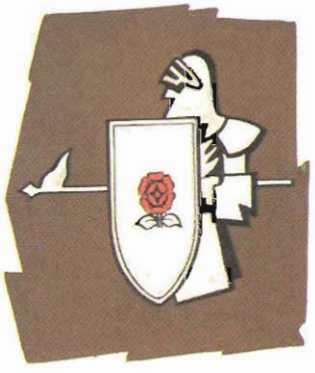
Upper surface camouflage is Scheme A Pattern 3 in Dark Green and Dark Earth, and under surfaces are night black. The 48 in. codes are in light grey, as is the serial. Upper wing roundels are Type B, 84 in. diameter; 54 in. Type C1 roundels appear on the fuselage sides. The fin flash is 24 in. square, with 11 in. red and blue stripes divided by a 2 in. white stripe; it was painted on both inner and outer surfaces of both fins.

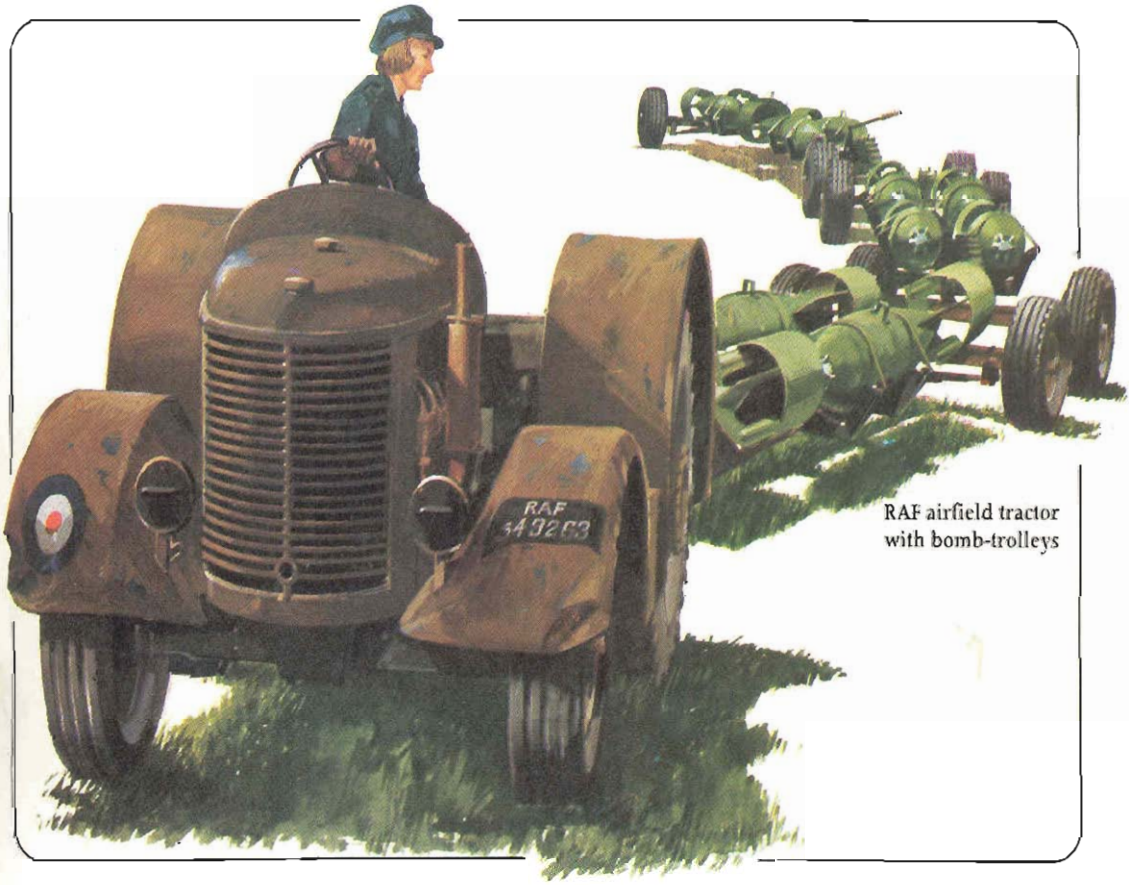
OPPOSITE, TOP: Unit and aircraft insignia. Top left is the badge of No. 9 Sqn, carried below cockpit on port side of Wellington Mk I, L4274, KA-K at Honnington in 1940. Top centre is the badge carried by some Wellingtons of No. 75 (New Zealand) Sqn below cockpit on port side, when based at Feltwell in 1940. Top right is the 'Popeye I' badge carried by Hampden AE238, EA-P of No. 49 Sqn at Scampton, 1941. Bottom left is the badge and Welsh motto carried by Manchester R5833, OL-N of No. 83 Sqn; and bottom right is the badge on the nose of Boston AL290, OM-K of No. 107 Sqn.

BELOW: Bristol Blenheim Mk IV, V5899, BG-J of No. 105 Sqn, based at Swanton Morley in July 1941. This is one of 12 aircraft which attacked Bremen docks on 4 July, led by Wg. Cdr. Hughie Edwards flying V6028 'D'; Edwards was awarded the Victoria Cross for this operation. As a day bomber the aircraft has Sky under surfaces. The light-grey codes appear as GB-J on the starboard side. Roundels are 66½ in. Type B on upper wing surfaces; 45½ in. Type A1 on fuselage sides; and 35 in. Type A on wing under surfaces. The fin flash is 27 in. high with equal 8 in. red, white and blue stripes.

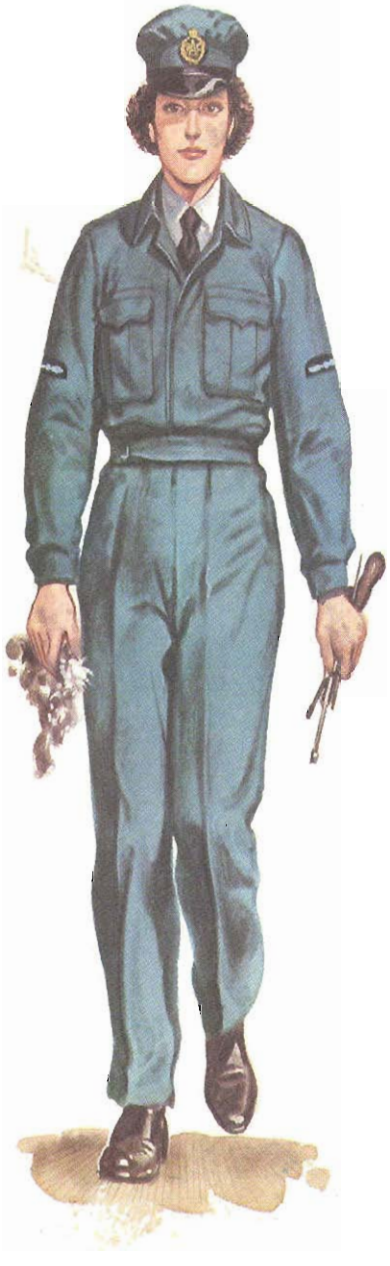


Bristol Blenheim Mk IV, V5899, of No. 105 Sqn RAF, July 1941





RAF airfield tractor with bomb-trolleys



Leading Aircraftwoman, WAAF, 1942. The women's branch of the Royal Air Force performed many tasks which freed men for combat duties, including mechanical trades such as armourer and instrument mechanic. This English rose wears the WAAF peaked cap with brass badge, and RAF-blue working battle-dress blouse and slacks. The only insignia worn on the battledress is the propellor of LACW on both upper sleeves in pale blue on dark blue.

RAF Bomber Command aircrew, 1941, wearing the buoyant suit of yellowish aerocord introduced that year. It was worn over a kapok lining, and the gloves and 1941 pattern flying boots were electrically heated. Note the collar bladder, designed to keep an unconscious man's head out of the water in an emergency. The parachute harness has chest hooks for attaching the D-rings of the parachute pack. The boots had a splinter-proof silk lining between the inner and outer layers. This airman holds a French language propaganda leaflet of the type dropped over occupied Europe – Courrier de l'Air.

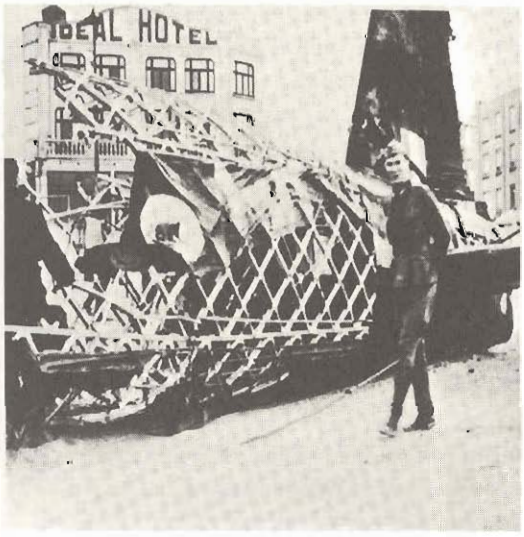
end of the month had received the first directive from the new C.A.S. outlining the policy he wished the new commander to follow, and this showed a significant shift in priorities. The main instructions of the directive were:

> 'the time seems particularly opportune to make a definite attempt with our offensive to affect the morale of the German people. . . . If bombing is to have its full morale effect it must on occasions produce heavy material destruction. . . . Regular concentrated attacks should be made on objectives in large towns and centres of industry, with the primary aim of causing very heavy material destruction which will demonstrate to the enemy the power and severity of air bombardment and the hardship and dislocation which will result from it.'

This directive set out to put the balance as fairly as possible between the demand for precision bombing on vital production areas, and haphazard bombardment of populated areas. But Portal already knew that the type of precision bombing required to destroy specific targets with a minimum of damage or loss of life to adjacent civilian areas was beyond the scope of the force available to Pierse. Those who still had doubts and clung firmly to the belief of a 300-yd error had their illusions shattered after the first RAF area attack on the city of Mannheim on 13 December by 134 Wellingtons, Whitleys, Hampdens and Blenheims. The following morning a photographic reconnaissance aircraft flew over Mannheim and its pictures showed remarkably little damage to the city which had been claimed to have been hit by 102 of the aircraft which raided it. Further and more damning evidence came from the same source after the Christmas Eve attacks on two separate oil plants at Gelsenkirchen. These installations were claimed to have been hit by 134

23. Wellington Mk IIIs of No. 30 O.T.U. at Hixon. The nearest machine, BK347, was written off in a crash at Whernside on 21 April 1944.

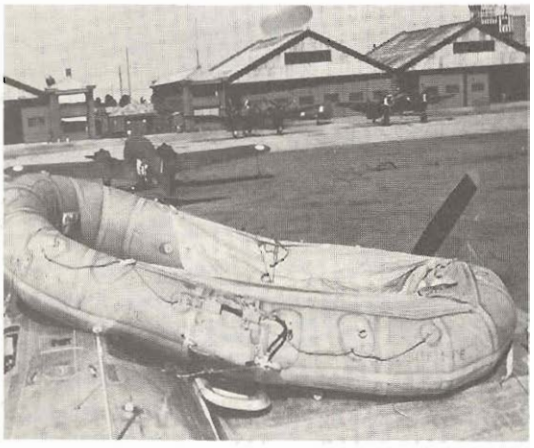
24. Two Luftwaffe aircrew pose with Wellington Ic T2501, LN-F of No. 99 Sqn, which landed in enemy territory. (Hans Obert via R. L. Ward)



25. A German soldier poses by the wreck of a Wellington which failed to return. The geodetic construction proved capable of sustaining massive combat damage without breaking up, and aircraft sometimes returned to base with huge areas of skinning completely peeled off, but the basic structure intact. (via R. L. Ward)

26. One of twenty Boeing Fortress Mk I bombers used for a short and disastrous period by Bomber Command in 1941; this is AN521 of No. 90 Sqn.

and 162 aircraft whose crews thought they had deposited over 250 tons of high explosives accurately on their targets. But photographic reconnaissance showed only a negligible number of bomb-craters, whereas if the reports had been accurate, there would have been about 1,000. This evidence was the clearest so far of the effect of the British bombing, but although Portal accepted it he also argued that such evidence could not always be taken as 100 per cent accurate, and advised the War Cabinet that Bomber Command could mount precision attacks on seventeen synthetic oil plants during the next four months, thus depriving Germany of 1½ million tons of oil, which might well bring an end to the war by the end of 1941. Portal's



27. This seven-man dinghy was stowed in the wings of bomber aircraft and released on impact with water. This typical example was in fact photographed at one of the E.A.T.S. schools in Australia. (via R. L. Ward)

apparent about-turn was in many ways a tactical move, for he knew that unless he could boost the faltering prestige of Bomber Command, he was unlikely to receive the production priorities for the heavy bombers he needed to carry out an effective area bombing policy.

The claims made in respect of the oil plants never materialized; by the time the Command had to diversify its efforts to help combat the U-boat, only two raids had been mounted against the seventeen vital plants and, by 31 March 1941, only 5 per cent of the sorties flown had been against such targets. About this time it was accepted that the pre-war assessment of a 300-yd error was hopelessly inaccurate, and this was doubled to 600 yds – still an optimistic figure at that time – which meant that twice the number of raids would be needed to achieve the same effect. In August 1941 Churchill, who had been becoming increasingly suspicious of the achievements of Bomber Command, asked his scientific and statistical adviser to carry out an investigation. This was done by a Mr Butt who was a member of the War Cabinet secretariat, and his analysis of target photographs forced him to conclude that only one in five bombing aircraft got within five miles of the target; he also pointed out that over the Ruhr the proportion was probably much less.

Although Churchill was concerned over his findings, he did not withdraw his support or faith in the bomber, but urged the development of scientific aids to help in navigation and target identification, he also overcame Cabinet reluctance to proceed with the establishment of a large bomber force and instructed that the national effort should be increased to reach the target of 4,000 bombers the Royal Air Force wanted. During these political moves the Command had been proceeding along the lines it had followed since early 1940, but it was trying to operate successfully against innate inefficiencies. Navigation was still a problem and there were no rules crews were obliged to follow as far as proceeding to and from their targets was concerned. At briefing, the target would be named and the crews informed of the existing and likely weather; heights at which to fly and bomb, routes

28, 29. Flg. Off. Cowan with the crew of his Wellington, X3794, WS-V of No. 9 Sqn at Waddington, with a girl who appears to be one of the Air Transport Auxiliary ferry pilots. The aircraft has been personalized by the painting of wives' or girl-friends' names on the nose. The beam view shows the groundcrew of 'Barbara-Mary' – note the beam machine gun position. Cowan was killed later in the war while flying Lancasters. (L. Brown via R. L. Ward)

to the target, times of take-off and in some cases even the bomb load to be carried, were all left to the discretion of the captain who might or might not discuss some of the finer points with his crew.

At this time pilots and crews went through basic training and their conversion courses separately, arriving on the squadrons as individuals where they joined crews as and when they could. Later this policy was changed and crews formed at Operational Training Units, from which they joined their squadrons as a trained and co-ordinated body. One sergeant air gunner, recalling his posting to No. 10 Squadron at Leeming in September 1941, relates that he flew his first operation with a crew of sergeants who had already done several trips. They did not speak to him all the way to the target and back, and on one occasion he thought they must have all baled out but was too frightened to switch on his intercom and ask! Hardly a state of affairs conducive to the *esprit de corps* which was so essential when each crew member depended on his colleagues. After this unusual first trip the gunner concerned managed to find another crew whose experience was as limited as his own, and stayed with them through his first tour which included a conversion onto the Halifax in December 1941, and subsequent raids against the *Scharnhorst* and *Gniesnau* during the infamous Channel Dash in February 1942, and the *Tirpitz* in March 1942. During the attempt to stop the *Scharnhorst* and *Gniesnau*, this gunner's Halifax, flown by Sgt. M. D. Gribben, navigated to the target area in dense cloud and when they emerged from it found several other bombers formating on them, so that a crew with only a few hours on the type of aircraft they were operating found themselves leading a formation attack!

Pilots were in some ways more fortunate, as they usually flew with another more experienced captain and crew before venturing forth on their own. Another No. 10 Squadron pilot, Sgt. Eric Griffin, who had joined the RAFVR in August 1939 and was posted to No. 10 Squadron on 13 September 1940, found himself as co-pilot to Plt. Off Bridson in Whitley P4946 ten days later for an attack on the docks at Boulogne. He did nine more trips in the second seat, attacking the U-boat base at Lorient, Eindhoven, Gelsenkirchen, Mannheim, Düsseldorf and Berlin before captaining his own crew to Rotterdam on the night of 13/14 March 1941. These trips enabled him to learn a lot from his more

experienced colleagues, not only as far as navigation and target identity were concerned, but also how to react quickly in an emergency. The latter invaluable experience came on the night of 19/20 December 1940 when, after attacking Berlin in Whitley P4961 captained by Plt. Off. Bridson, the aircraft's starboard engine developed a glycol leak and eventually seized up over Holland. Bridson demonstrated the art of asymetric flying under operational conditions to perfection, but soon after crossing the English coast the port engine went into fully coarse pitch and the crew, including the now-much-wiser Sgt. Griffin, took to their parachutes. When he did form his own crew, Sgt. Griffin was well aware of all the problems that long-range night flying and the intense cold and high altitude brought. In addition to the hazards of operating over enemy territory some of the early bomber crews also had to face close interrogation from their own intelligence officers, not only in reporting on successful trips but also on those that were aborted. This type of interrogation did, of course, continue throughout the war but Eric Griffin claims that in the early days it was usually carried out with much less feeling and understanding than crews experienced when the bomber offensive really got under way. In some quarters it was a strongly held belief that crews would not always fly to targets they considered difficult or well defended, and to return with an aircraft which was claimed to be faulty but had somehow corrected its malaise on the way back was almost sure to bring the finger of suspicion pointing in the pilot's direction. On the evening of 27 March, Sgt. Griffin flew Whitley Z6496 to Düsseldorf, but on the way excessive vibration caused him to abandon the trip and jettison his bombs. On his next trip to Keil on 8 April, flying the same aircraft, the same conditions recurred and once again the trip was aborted. The unfortunate pilot, who was then just twenty years old, was suspected of cowardice and resigned himself to the fact that a Court Martial could follow. But two nights later another pilot took the same Whitley on a raid from which he failed to return and Griffin's claims of excessive vibration were, in the eyes of the authorities, justified. Difficulties such as these tended to make crews resent authority of a certain type, which must have done little for morale; but on the other hand they learned from their experiences which those who survived were able to pass on to those who followed when they became instructors at O.T.U.s after their first tours. The value of operational experience passed on by a veteran aircrew was one of the bonuses to come from Bomber Command's first two years of war; for at an O.T.U. the practical experience of a man who had experienced the incidents he was passing to the trainees was accepted as fact, rather than unproven theory.

30. The first of the 'heavies' – Short Stirling MG-D of No. 7 Sqn, which received the type in August 1940. Note the enormous ground clearance, and the ladders needed to service the engines.

31. Whitley Mk V, Z9466 of No. 10 O.T.U. undergoing air test on the morning of the first Thousand Bomber raid, 30 May 1942. This aircraft is the subject of the five-aspect painting on pp. 28–29. (R. E. Griffin)

Apart from his experience with Bridson and the vibrating Whitley, Sgt. Griffin encountered other problems including one on 27 May 1941 when

flying Whitley Z6586 on a raid to Düsseldorf. The aircraft, with Sgt. Griffin as captain, Sgt. Tripp as co-pilot, Sgt. Zalsburg as the observer, and Sgts. Christie and Duval manning the turrets and radio, left Leeming just before 2300 hours. The following report written by Sgt. Griffin soon after he landed outlines in factual but undramatic terms exactly what happened:

'On reaching operational height (approx 14,000 ft) I decided to decrease revs which were then between 2,350 and 2,400, the boost was $+1\frac{1}{2}$, mixture weak and the highspeed supercharger was engaged. Air temperature was −12. The time was then 0100 hrs and ASI 115 mph. The exactors seemed a little stiff and I moved the starboard lever down slightly after seemingly removing a blockage, at the same time the stbd. revs. dropped right down and the boost fell from $+1\frac{1}{2}$ to approx $-1\frac{1}{2}$. I attempted to increase the stbd. revs. but although it was possible to raise the exactor lever the revs did not rise so I throttled the engine back to about −4. As we were losing height I attempted to increase the port revs which were approximately 2,400 but the same thing happened and I moved the exactor lever right up without any increase in revs. As soon as the starboard engine revs dropped I put the mixture to rich, increased the port boost to +4. I decided to return to base at 0110 hours and dropped my bombs on an airfield which I had passed on the way out [this was over Holland] approximately 10 minutes later at a height of 12,000 ft. After the bombs had gone I decreased the port boost to +3 at which I could maintain height at an indicated airspeed of 100 mph with the starboard engine still at 1,600 rpm and the boost at −4. On leaving Holland I throttled the port engine back and decreased height to come down below the freezing level at approximately 0200 hours. At 0216 hours the stbd. engine picked up and both exactors were OK. I held the exactors fully up and primed the system whereupon the revs on both engines went to approximately 3,000 rpm and by lowering the exactors found the engines were working perfectly normally with the revs steady at approximately 2,300 rpm.'*

*Original report in possession of the author. The exactors were *in* fact pitch levers.

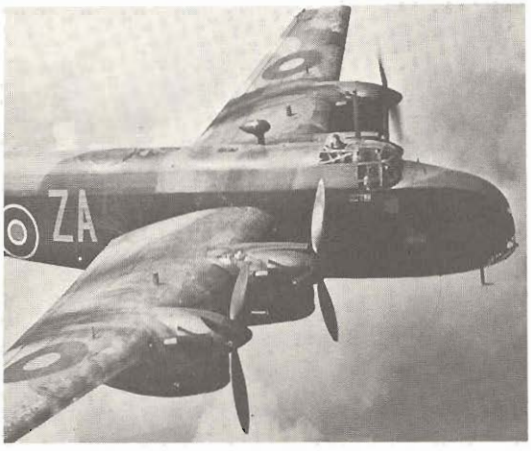
32. Halifax Mk I photographed at Northolt on 21 July 1941. The Halifax was the second of the RAF's four-engined heavies to enter service.

The Whitley subsequently returned to Leeming where it landed safely after five hours twenty minutes of flying time, most of which had been spent combating the elements as outlined in the above report, which is reproduced exactly as it was written at the time.

The Whitley, Wellington and Hampden flew with a five-man crew, two of whom were usually pilots; but, as training methods improved and the whole subject of navigation and crew duties were reconsidered, specialists were introduced. The result was that, by the time the four-engined heavies reached operational status, crews consisted of pilot, flight engineer, navigator, radio operator, bomb-aimer and two air gunners. In the case outlined by Sgt. Griffin a qualified engineer would have been trying to sort out the problems of the recalcitrant engines, while a specialist navigator would have been concentrating on finding a safe route home, and the bomb-aimer would no doubt have placed the bombs more accurately on the Dutch airfield. As it was, two pilots, one of whom was inexperienced, were faced with the problems of the engines and navigation, whilst the observer was trying to map-read and deposit the bombs. This sharing of tasks should be remembered and taken into account when assessing any of the 1940–41 night operations.

The new Stirling brought a better start to 1941, making its operational debut in the hands of No. 7 Squadron on the night of 10/11 February against oil storage tanks in Rotterdam. Almost a month later the second of the four-engined heavies, the Halifax, which had entered service with No. 35 Squadron on

13 November 1940, also made its operational debut over Le Havre. Sandwiched between these two came the ill-fated Manchester, which entered the arena in the hands of No. 207 Squadron on the night of 24/25 February when the *Hipper* was attacked in the docks at Brest. Brest was to be a regular destination for Bomber Command in the next ten months as they repeatedly tried to cripple the battle cruisers *Scharnhorst*, *Gneisnau* and *Prince Eugen*, which were sheltering there. The Manchester was a dismal failure as a twin-engined bomber, its Rolls Royce Vulture engines proving troublesome throughout its service career. Of the 209 aircraft built, over 65 per cent were lost, 40 per cent of them on operations; engine failures, airframe defects and other technical frailties accounting for many other losses. The aircraft entered service as Bomber Command was looking for new machines to increase its effective strike power, and was phased out barely sixteen months later, in June 1942, just as this sought-after power was being discovered. But,



33. Halifax B.II Srs. I, BB324 ZA-X of No. 10 Sqn flying with starboard engines feathered. (via R. L. Ward)

Appendix A

In 1939 RAF Bomber Command dispatched 591 aircraft on bombing raids during which they dropped 31 tons for a loss of 38 aircraft. The following year 22,473 aircraft were dispatched and dropped 13,033 tons losing 475 of their number and, in 1941, 923 of the 32,012 aircraft which dropped 31,704 tons were lost. In the whole of 1942 the totals had risen to 35,338 aircraft taking part in raids, of which 1,450 were lost and the tonnage dropped 45,561. During the first six months of this year three 1,000 bomber raids took place and on the first of these Whitley Z9466 took the following load to Cologne.

This form was handed to Wt./Off. R. E. Griffin on the night of 31 May 1942.

OPERATIONAL EXERCISE

This pro-forma is to be completed and handed to the Bomb Aimer by a Flight Armament N.C.O. prior to take off. The Flight Armament N.C.O. is to ensure that the Bomb Aimer fully understands the pro-forma and in fact is to ensure that all members of the crew know the location of the armament

Date 31 May 1942 Aircraft No Z9466 Flight D
Bombs to be carried: 6 SBCs 2 500 lb HE GP Mk IV
Fused at: Tail
Flares to be carried: Nil *Fuse:* Nil *Capsules:* Nil *Flight:* Nil
Flashes to be carried: Nil *Fuse:* Nil *Set At:* Nil
Flame Floats to be Carried: 2
Bombs H.E. Selector Switches: 2 4
Bombs H.E. Distributor Contacts: 2 4
Bombs H.E. At Bomb Stations: 10 8
S.B.C. Selector Switches: 10, 12, 14, 16, 6, 8
S.B.C. Distributor Contacts: 10, 12, 14, 16, 6, 8
S.B.C. At Bomb Stations: 3, 4, 5, 6, 7, 9

Flash Launched Secs after First Bombs

Height	*Secs*	*Camera Tilt*
8,000 ft	8	8° forward tilt
9,000 ft	8	
10,000 ft & above	10	(above 160 mph G.S. camera not tilted

Time Interval for Incendiaries After Last Bomb

Height	*Secs*	*Height*	*Secs*
8,000 ft	7	12,000 ft	10
9,000 ft	7	13,000 ft	11
10,000 ft	8	14,000 ft	12
11,000 ft	9	15,000 ft	13

Signed *G. Sanford W.O.* signature of Flight Armament N.C.O.

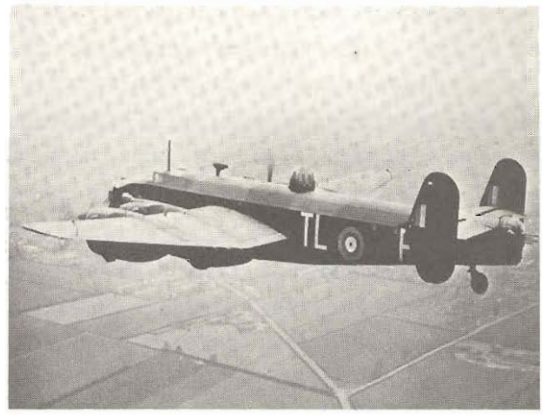
Dated 31.5.42

although it was disliked by its crews and has a far from happy service record, it did lead to the production of the famous Lancaster which turned out to be the best weapon in the Command's inventory when strategic bombing came of age.

As more heavy bombers joined the squadrons the tempo increased, but there was still a lot of work left for the Whitleys and Wellingtons, including the use of the first 4,000 lb bombs; two Wellingtons of Nos. 9 and 149 Squadrons dropped these on Emden on 1 April. Prior to this two Wellingtons had also carried out what was probably the most effective piece of precision bombing so far, when specially equipped aircraft had homed onto the German Knickebein radio navigational beams the previous November and successfully destroyed one of the transmitting stations.

Before the British-built four-engined bombers became available, the government had purchased a quantity of Boeing B-17C aircraft which they christened Fortress I. These arrived in England on 14 April 1941 and were issued to No. 90 Squadron, who used them operationally for the first time on 8 July against Wilhelmshaven. The Americans had strongly urged that the aircraft should not be used operationally as they were still suffering from teething troubles, but this advice was ignored and they were introduced in an attempt to provide a high-altitude bombing force. During the next three months No. 90 Squadron encountered problem after problem, losing several aircraft to enemy fighters and unexplained crashes, which eventually led to the Fortress I being withdrawn from European operations by the RAF in September. Later and better versions did of course serve with the USAAF where they successfully formed the daylight element of the round-the-clock bomber offensive in 1944–45.

As well as the operational debuts of the Stirling and Halifax, 1941 also saw the first trials of 'Gee', which was one of the navigational aids given priority by the Churchill directive of 1940. This was an extremely accurate method of enabling an aircraft to fix its position; it relied on three ground stations, A, B and C situated as widely apart as possible. Stations A and B, and A and C transmitted



34. Halifax B.II Srs. 1, W7676, TL-P of No. 35 Sqn; this machine failed to return from a raid on Nuremberg on 28/29 August 1942. (via R. L. Ward)

two pulse signals simultaneously and an instrument in the aircraft measured the difference in time between the receipt of signals from A and B and A and C. It then converted this difference into a distance between A and B and A and C. The differences were the lines of constant path differences along which the aircraft was flying between A and B and A and C, and its position was at the intersection. The fix was instantaneous, and the two readings from the instrument could be readily plotted on a special chart, known as the Gee Lattice Chart. This navigational aid was first tried on the night of 11/12 August 1941 by two Wellingtons of No. 115 Squadron which accurately bombed München Gladbach, but it was then removed from the aircraft until such time as a worthwhile force could be equipped and trained in its use; such a force was ready by March 1942 when 211 aircraft, of which 74 were Gee-equipped, bombed Essen.

Daylight sweeps by Blenheims and the occasional daylight raid by Stirlings were carried out during the summer and autumn of 1941 in support of Fighter Command's efforts to carry the war to the Germans in Europe, but all the time the underlying emphasis was on night bombing and there was never any danger of a reversion to a policy of heavy daylight bombing, despite the fact that navigation was improving, and fighter cover could be given to a certain extent.

But in November 1941 the night offensive

received a severe blow when a 10 per cent loss on the night of 7/8 November brought an order that virtually banned bombing for a three- to four-month period. The object of this was to conserve the Command's still-static force and enable it to build up to a strength that could be turned against Germany the following spring. Bombing did not stop completely, as small forces were still allowed to operate against close-range targets, but raids by big forces against distant objectives were definitely out.

For some time Bomber Command had been trying to arrange raids on targets that comprised areas of high combustibility, where incendiary bombs dropped by picked crews would cause a rapid growth in fires which would give following crews a better aiming point. In theory this was an excellent idea but, until proper planning produced the bomber stream which passed in a block over the target and bombed at pre-set short intervals, it was destined to failure. However, it did lead to the formation of the Path Finder Force in August 1942 which, together with the new radar navigational aids, improved bomb sights, and radar identification of targets, was a vital factor in the final effectiveness of the bomber campaign. The formation of this force led to some controversy, as it

35. Stirling N3705, MG-F of No. 7 Sqn attracting the interest of Luftwaffe officers after its crash-landing near Gorkum, Holland at 0658 hrs on the morning of 16 August 1942. Sgt. S. C. Orrel and his crew took off from Oakington just after midnight on a mine-laying sortie; they survived the crash and were captured. The Stirling was repaired by the Luftwaffe and flew again on 5 September 1942; it was used for comparative evaluation tests.

36. A Boston of No. 88 Sqn starts its port engine. This American aircraft started replacing the Blenheim for close-support work and shipping strikes from October 1941.

was feared that it would lead to the formation of an élite and to the generation of jealousy among crews not picked to form part of it. But these fears did not materialize and the P.F.F. became a vital part of Bomber Command, eventually becoming a group in its own right in January 1943 – No. 8 P.F.F. Group.

With new aircraft, new navigational aids and new crews reaching the squadrons Bomber Command was poised in February 1942 to undertake a much more effective campaign than it had been able to mount to date. It was this situation that greeted its new commander, Air Marshal A. T. Harris, when he took up his appointment as A.O.C.-in-Chief on 22 February. Harris, who had been one of the early advocates of precision bombing, now realized that area bombing, in which whole cities as well as industrial complexes would be completely destroyed, was the best method of attack for his bombers. He became so absorbed by his theories that on many occasions he openly claimed that this usage of Bomber Command could in itself win the war for the Allies.

Harris was not only an efficient professional airman, but also a shrewd man who could cope with the political in-fighting that had threatened his command in the years before he took it over. He constantly urged the production of the heavy bombers he knew he needed to fulfil his objectives, and also became impatient about the delays in equipping his squadrons with the radar aids he knew they must have. In an endeavour to silence

the critics of his policies once and for all, he took a calculated gamble in mounting a heavy raid against the Renault factory at Billancourt. Delays while he waited for the equipment he desperately needed could give the time for an irrevocable political decision to be taken that would make the proof of his theories very difficult. So on the night of 3/4 March 1942, 235 aircraft were dispatched on the first raid in which the principle of concentration in time and space over the target was used. The average rate over the target proved to be 121 aircraft per hour and, of the force sent, 223 claimed to have hit their objective. The Renault factory was razed to the ground and hardly a bomb fell outside the target area. Harris was overjoyed with the result, but he knew that the weather had been ideal, and the defences caught unawares; what was really needed was a similar result from an attack deep in Germany. This came on 27 March when 120 bombers dropped their bombs on one aiming point in Cologne within a space of twenty minutes without losing one of their number. The following night a long-planned incendiary raid was mounted against Lübeck which resulted in the destruction of over 200 acres of the built-up area. Similar raids on four successive nights against the port of Rostock, in which the Heinkel factory was severely damaged and large areas of the port were laid to waste, seemed to vindicate the policy of area bombing, as well as proving the value of Gee which had been used on each occasion. But, in order to end all criticism Harris needed one or two raids involving large forces of bombers against an industrial target, which would demonstrate to the world what a properly equipped and expanded bomber force could do.

The success of such an operation would depend largely on Gee and a full moon, the next of which was in May, so plans were made to mount the biggest raid of the war so far. The total of aircraft set by Harris was 1,000 which, in view of the daily serviceable average of 416 at that time, looked extremely optimistic. If 100 per cent serviceability could be reached, 550 front-line squadron aircraft would be available; to this Harris proposed to add machines from the operational training units crewed by instructors and senior pupils. This was also a calculated gamble by the C-in-C, for if these crews failed him and the loss rate was high the future of his expansion programme would be seriously jeopardized.

Appendix B

Bomber Command Order of Battle
26 September 1939

H.Q. Advanced Air Striking Force		
71 Wing Nos. 15 and 40 Sqns	Operational	Fairey Battle
72 Wing Nos. 105 and 226 Sqns	Operational	Fairey Battle
74 Wing Nos. 103 and 150 Sqns	Operational	Fairey Battle
75 Wing Nos. 88 and 218 Sqns	Operational	Fairey Battle
76 Wing Nos. 12 and 142 Sqns	Operational	Fairey Battle
No. 2 Group		
82 Wing Nos. 114 and 139 Sqns	Operational	Bristol Blenheim
83 Wing Nos. 107 and 110 Sqns	Operational	Bristol Blenheim
79 Wing Nos. 21 and 82 Sqns	Operational	Bristol Blenheim
No. 101 Sqn	Reserve	Bristol Blenheim
No. 3 Group		
Nos. 9, 37, 38, 99, 115, 149 Sqns	Operational	Vickers Wellington
Nos. 214 and 215 Sqns	Reserve	Vickers Wellington
No. 4 Group		
Nos. 10, 51, 58, 77 Sqns	Operational	A.W. Whitley
Nos. 78 and 102 Sqns	Reserve	A.W. Whitley
No. 5 Group		
Nos. 44, 49, 50, 61, 83, 144 Sqns	Operational	H.P. Hampden
Nos. 106 and 185 Sqns	Reserve	H.P. Hampden
No. 6 Group		
Nos. 7 and 76 Sqns	Pool Sqns	H.P. Hampden
Nos. 75 and 148 Sqns	Pool Sqns	Vickers Wellington
Nos. 97 and 166 Sqns	Pool Sqns	A.W. Whitley
Nos. 90, 104 and 108 Sqns	Pool Sqns	Bristol Blenheim
Nos. 35, 52, 63, 207 Sqns	Pool Sqns	Fairey Battle
No. 98 Sqn	Reserve	Fairey Battle

The target selected was Cologne, and the date set for the night of 30/31 May 1942. On the appointed day the weather looked good with fine conditions over the home bases for the returning aircraft: a necessary prerequisite in view of the high number of crews taking part. With most of the squadrons at full strength, hundreds of crews from operational and heavy conversion units, and reserve aircraft manned by volunteers from Station, Group and Command staff, the returns indicated that 1,048 aircraft were ready to go. The force consisted of Whitleys, Wellingtons, Stirlings, Halifaxes, Manchesters and sixty-eight of the new Lancasters, which had entered service only the previous December and carried out their first operation on 10/11 March. A total of 1,046 aircraft took off for Operation *Millennium* and, of these, 898 attacked the target area and forty failed to return.

Reconnaissance photographs were impossible the next day due to cloud and smoke from fires, but when these were finally taken they showed that damage on an unprecedented scale had occurred. Most important of all, losses were less than on a normal raid and the attack on a single objective by a vast force had proved practical. The British and American public were overawed by the success and Prime Minister Winston Churchill was impressed enough to send the following message to Harris:

> 'I congratulate you and the whole of Bomber Command upon the remarkable feat of organisation which enabled you to despatch over a thousand bombers to the Cologne area in a single night and without confusion to concentrate their action over the target in so short a time as one hour and a half. This proof of the growing power of the British Bomber Force is also the herald of what Germany will receive, city by city, from now on.'

The final sentence convinced Harris that his gamble had paid off, and the British Government was now firmly committed to the policy of reducing German military and industrial strength by air bombardment.

Two more 1,000 bomber raids were mounted against Essen on the night of 1/2 June during which thirty-one aircraft were lost, and Bremen on 25/26 June when forty-four Bomber Command and five Coastal Command aircraft failed to return. After its years in the wilderness Bomber Command was at last silencing its critics: the crisis which threatened its very existence in 1940 had been weathered, and in the devastation around Cologne, Essen and Bremen lay a foretaste of what was to come. Harris's new-look Bomber Command had risen Phoenix-like from the flames of the Battles which littered France in 1940, and heralded the dawn of a new chapter in strategic bombing.

THE AIRCRAFT

Armstrong Whitworth Whitley

The Whitley which was designed to Air Ministry Specification B3/34 made its first flight on 17 March 1936 and was displayed at the RAF Display Hendon that year. The aircraft had been selected as major equipment for the planned rebuilding of the RAF and entered service with No. 10 Squadron at Dishforth in March 1937. The Whitley I of which thirty-four were built was powered by Tiger IX radial engines, and was followed by the Whitley II and III which used Tiger III power units. The Whitley IV was fitted with Rolls Royce Merlin engines and a Nash & Thompson power-operated rear turret. The major production version was the Whitley V which had Rolls Royce Merlin X engines and was about 15 in longer than its predecessors. Production started in 1939 and ended in 1943 after 1,466 aircraft had been built. The Whitley was also used by Coastal Command and after its withdrawal from front line service with Bomber Command was used in many roles including training, glider towing, and parachute troop training. Details of Mk V as follows:

Span 84 ft *Length* 69 ft 3 in. *Height* 15 ft *Power units* Two Rolls Royce Merlin X *Armament* Four ·303 machine guns in tail turret, one ·303 machine gun in nose turret *Weight empty* 19,330 lbs *loaded* 28,200 lbs *Range* 1,650 miles with 3,000 lb bomb load *Max*

speed 192 mph at 7,000 ft. *Cruising* 160 mph at 16,000 *Service ceiling* 19,000 ft.

The Fairey Battle

First entering service with No. 63 Squadron in May 1937 the Battle was something of an anachronism when the war started two years later. Part of the RAF's planned expansion programme of the thirties, the Battle first flew on 10 March 1936 and continued in production until December 1940 when over 2,100 aircraft had been built; about 1,000 of these were manufactured by the Austin Motor Company under the Shadow Factory scheme introduced to disperse aircraft production. A low wing, three seat, light day bomber of all metal stressed skin construction, the Battle was a big aircraft which was sadly underpowered by its Rolls Royce Merlin I, II, II or V engine. The aircraft suffered badly in France and was relegated to the training role in 1941.

Span 54 ft *Length* 42 ft 1¾ in *Height* 15 ft 6 in *Power unit* One Rolls Royce Merlin I, II, III or V *Armament* One forward firing ·303 Browning machine gun and one rearward firing Vickers K gun *Weight empty* 6,647 lbs *loaded* 10,792 lbs *Range* 1,050 miles *Max speed* 241 mph at 13,000 ft *Cruising* 210 mph at 10,000 ft *Service ceiling* 23,500 ft

The Vickers Wellington

Designed by the famous Barnes Wallis and using the geodetic principle of construction, which was a lattice type framework for which the designer was also responsible, the Wellington is perhaps the best-known bomber of World War II after the Lancaster. It entered service in October 1938 with No. 9 Squadron and by the outbreak of the war six Wellington squadrons were operational with a further four working up. The aircraft bore the brunt of Bomber Command's early offensives and served throughout the war although it was withdrawn from front-line European bombing operations in October 1943. It was well liked by the crews who flew it, and they wasted no time in giving it the nickname 'Wimpey' which was taken from the character J. Wellington Wimpey in the popular Popeye strip cartoon. A total of 11,461 Wellingtons were built and the T10 version stayed in RAF service until 1953.

Span 86 ft 2 in *Length* 64 ft 7 in *Height* 17 ft 5 in *Power units* Two Bristols Pegasus XVIII *Armament* Two ·303 machine guns in nose and tail turrets and two manually operated ·303 machine guns in beam positions. *Weight empty* 18,556 lbs *loaded* 28,500 lbs *Range* 1,200 miles with 4,500 lb bomb load *Max speed* 235 mph at 15,500 ft *Cruising* 220 mph at 12,000 ft *Service ceiling* 18,000 ft

The Bristol Blenheim

The Mk IV bomber version of the Mk I which originated as a private venture from a 'one off' high speed transport, entered service with No. 90 Squadron in March 1939. A light bomber with a crew of three, the Blenheim was all metal stressed skin construction and was used successfully in daylight sweeps, after being mauled in France by the Luftwaffe. Over 3,290 aircraft were built and they were withdrawn from Bomber Command in August 1942. Details of Mk IV as follows

Span 56 ft 4 in *Length* 42 ft 7 in *Height* 9 ft 10 in *Power Units* Two Bristol Mercury XV radial engines *Armament* One forward firing ·303 machine gun and two ·303 machine guns in dorsal turret. Some aircraft also had two ·303 machine guns in ventral blister beneath nose *Weight empty* 9,790 lbs *loaded* 14,400 lbs *Range* 1,460 miles *Max speed* 266 mph at 11,800 ft *Service ceiling* 22,000 ft

The Avro Manchester

The ill-fated Manchester was one of the RAF's biggest disappointments of World War II. It never lived up to its design specification and stayed in service for only sixteen months, commencing with No. 207 Squadron in February 1941 and flying its last operation on 25/26 June 1942. Total production was only 209 aircraft and the majority of these were lost on operations. The Manchester developed into the famous Lancaster thus achieving some measure of recognition. Details of Mk I as follows:

Span 90 ft 1 in *Length* 70 ft *Height* 19 ft 6 in *Power Units* Two Rolls Royce Vultures

Armament Eight ·303 Browning machine guns, located two in the nose turret, two in the dorsal turret, and four in the tail turret. *Weight empty* 29,432 lbs *loaded* 50,000 lbs *Range* 1,200 miles with a 10,350 lb bomb load *Max speed* 265 mph at 17,000 ft *Cruising* 185 mph at 15,000 ft *Service ceiling* 19,200 ft

Handley Page Hampden

The last of the trio of twin-engined bombers to enter RAF service during the pre-war expansion programme, the Hampden differed from its other two contemporaries in that it had no power-operated gun turrets. The unusual shape of the narrow fuselage which brought such appellations as 'The Flying Tadpole' and 'The Flying Panhandle' was one of the aircraft's major shortcomings as its cramped interior led to fatigue on long flights, and gave other crew members little opportunity of recovering control of the aircraft in the event of serious injury to the pilot.

The Hampden was faster than both the Wellington and Whitley and carried a greater bomb load than the shorter-ranged Blenheim. It was extremely manoeuvrable but even this asset did little to help it during daylight operations, when its manually-operated guns proved to have many blind spots. Entering service with No. 49 Squadron in August 1936, the Hampden equipped the whole of No. 5 Group when war broke out in September 1939. A total of 1,270 aircraft were built in England and 160 in Canada. It operated with Bomber Command from the first day of the war until the night of 14/15 September 1942 when it carried out its last operational sortie. After this it served with O.T.U.s and with Coastal Command as a torpedo bomber.

Span 69 ft 2 in *Length* 53 ft 7 in *Height* 14 ft 11 in *Power Units* Two Bristol Pegasus XVIII *Armament* Six ·303 machine guns located one fixed forward, one movable forward, two in top and ventral turrets *Weight empty* 11,780 lbs *loaded* 18,756 lbs *Range* 1,885 miles with 2,000 lb bomb load *Max speed* 254 mph at 13,800 ft *Cruising* 167 at 10,000 ft *Service ceiling* 19,000 ft

Appendix C

The following memorandum was issued to the O.C. No. 10 Squadron by the Squadron's Bombing Leader on 3 February 1941. It serves to illustrate the rather complicated procedure that was expected of the squadron's Whitley crews at a time when night bombing was rather a hit or miss affair.

To: O.C. No. 10 Squadron
From: Squadron Bombing Leader
Date: 3 February 1941

Suggested procedure to be adopted by Air-Crews whilst locating and attacking target.

(1) *Before take off* the Observer selects prominent landmarks on the route across enemy territory to the target. It is recommended that the map used be 1/300,000, as this is the best scale for operational heights of 10,000 ft. and above. Those landmarks the Observer should note down together with the distances from the coast and between each other.

(2) *In the Air* the second Pilot occupies the front turret until target is located and positively identified. He is to be equipped with a complete set of 1/500,000 or ½ inch maps covering the route across enemy territory from the coast to the target. He should make *every* effort to get pin-points, paying particular attention to the prominent landmarks already noted by the Observer. The E.T.A. at those points should be communicated to him by the Observer some ten minutes before the actual E.T.A. It should be stressed that the second Pilot should not communicate a pin-point to the Observer unless he is positively sure of his identification, as it is better for the Navigator to have a hazy idea as to the position of the aircraft, than to re-set course from a false position.

(3) Some little time, say fifteen minutes before E.T.A. on Target is up, the Observer should work out the course for home from the Target and pass this to the Captain who should secure this in a *safe* place.

(4) When the target is located and positively identified the Captain gives the order to the Observer and the second Pilot to change places. While the target was being identified the Observer should have secured his maps, instruments etc, so that in the event of any windows being opened, they will not be blown on to the floor or lost. The C.S.C. the Observer should take with him to the turret. As regards the change-over, this can only be achieved quickly by complete co-operation between the Observer and second Pilot and the chief essentials for this co-operation are as follows:—

The change-over should be practised in full flying kit in a machine on the ground. A method can then be evolved for the actual passing which should take place in the well in the vicinity of the escape hatch. The second Pilot should stand with his back to the automatic Pilot, slightly crouched, and the Observer will then be able to squeeze past him. They should commence the change-over immediately the order to do so is

given, for instance, if the Observer lags, it means that the second Pilot is standing in the well waiting for him, during which time he would be better employed keeping the target in view.

(5) When the attack is taking place the second Pilot should note the exact time at which the bombs are dropped, height, number of sticks etc., as this can be later incorporated in the log by the Observer when he returns to the cockpit.

(6) When the attack is completed, the Captain sets course for home, and the second pilot takes careful note of the time, and then, when the Observer has finished checking his bomb switches and has ensured that all the bombs have gone, he and the second Pilot change places again.

Appendix D

Detailed below are the contents of A.P. 1548 as published in March 1936 and reprinted May 1940. This form was handed to all aircrew who were likely to take part in operations over enemy territory:

NOTES

1. On the outbreak of hostilities a copy of this publication is to be issued to every officer and to every airman whose duties might take him over enemy territory. An issue is to be made to every officer and to every such airman who joins the unit during the period of hostilities, unless he already has a copy.

2. C.O.s are to ensure that all other personnel have a broad knowledge of the principles laid down herein.

PART I

Information that should be given in the event of falling into the hands of an enemy

All that a Prisoner of War need give in the way of information, and all that in the interest of his country and comrades he should give, is his name and rank, or alternatively he need only give his regimental number. The enemy may threaten you, but remember he dare not carry out his threats, and if you refuse to give him information he will respect you much more. Always remember that, however friendly he may appear, he is an enemy.

PART II

What the enemy will try and find out from you

1. Any information about any unit of the Army, Navy, or Air Force.
   - What do you belong to?
   - Where is it stationed? and what is its strength?
   - Where are other units stationed?
   - What have been their recent movements? Any rumours as to future movements?
   - What do you know about casualties suffered?
2. Types of Aircraft—performances—new designs—and armament. Building and Supply.
3. Air stations and Landing Places at home and abroad.
4. Meteorological. Anything about the weather, recent or forecasts.
5. Any question of training—Tactical methods—British, or what you know of enemy methods.
6. Air Defence organization and A.A. Defences.
7. Home Conditions—Politics—Food Supply—Spirit of the People and serving forces.

Remember that the men talking to you are enemies.

PART III

Sources and methods which may be employed by an enemy to derive information

These notes are based on fact. They are made from the experience of men who have actually been Prisoners of War and who know what they are talking about.

Section I. Sources

1. From captured material and markings.
2. From papers found in aircraft.
3. From repeated interrogation; by professing sympathy; simulating professional and technical interest; or by threats.
4. From notebooks, diaries, personal letters and effects.
5. From letters written by and to the personnel of captured aircraft.
6. From conversations overheard by means of a concealed 'microphone'.

Section II Methods

1. By impersonating British or Allied prisoners and mixing with genuine prisoners.
2. By use of concealed microphones: for example:
   (a) By leaving you in solitary confinement for a few days. This will make you long for society and conversation. Then allowing you to be alone with a friend, apparently by a lucky chance, and recording your conversation by a concealed microphone.
   (b) By putting you in a room with an appropriate map on the wall in the hope that the map will recall memories to you and that you will talk about them.

Because you can't find the microphone don't think there aren't any. There are.

The enemy may be listening

3. By using agents in the form of a hospital nurse or attendant, who will profess to be a neutral and sympathise with the British or their Allies.
4. By suggesting that another officer or man has talked freely, giving the impression that silence is no longer of value.

5. By friendly reception and good treatment on capture.
6. By renewed interrogation long after capture, not necessarily by direct inquiring but casual and seemingly friendly interest.

Beware of the confidence trick and remember the man talking to you or listening to you is an enemy.

PART IV

DONT'S

1. Don't hazard your country or comrades by discussing any Naval, Military, Air Force, or aeronautical matters with anyone.
2. Don't give any information other than name and rank. This is the extent of your obligations. (The enemy impose the same obligations on their own officers and men).
3. Don't refer in any circumstances to your unit and position. A careless word may cost old comrades their lives.
4. Don't forget to destroy, if possible, your aircraft, maps, etc., by fire if brought down. You have instructions but don't forget the imperative necessity of giving effect to them.
5. Don't carry or allow anyone else to carry papers, official or private, on a flight. An envelope may give away information. Everything gives something away, even an old Tram Ticket or a bill. Don't forget to turn your pockets out before going up as a matter of routine even if you don't expect to go over the enemy lines.
6. Don't allow your kit to bear any tradesmen's tabs or labels of your school or station, or have any marks, other than official, on your identity disc.
7. Don't forget there are expert interrogators who will obtain information from you if you enter into conversation with them on even seemingly unimportant subjects. Therefore don't be interrogated. You need not be. Silence is safe.
8. Don't feel clever, they have had more experience than you have.
9. If you write a note to say you are safe, which has to be dropped over the line—
   Don't address it to anyone else than Headquarters, Royal Air Force. Your letter will be received and your relatives informed.
   Never address such a letter to your squadron, wing, or aerodrome.
   Never indicate the portion of the line on which it is to be dropped.
10. Don't write to anyone a single word relating to any incident whatsoever preceding your capture.
11. Don't address officers or men of the other service in any way indicating their unit or the position of their unit. Address letters to their home addresses in the United Kingdom, if known, otherwise write c/o Air Ministry (London) or c/o G.P.O. London in case of other services.
12. Don't believe anything you are told from enemy or possible enemy sources. Be patient, and, above all, silent.
13. Don't be drawn into any discussion of our own or our Allies' aviation programmes or their progress.
14. Don't carry these instructions in your aircraft, but don't fail to carry every word of them in your head.
15. Don't be downhearted if captured. Opportunities for escape will present themselves. Keep your eyes and ears open for any information which you think may be of value should you succeed in escaping.
16. Don't help enemy propaganda by letting yourself be persuaded to broadcast. Remember it is strictly against orders.
17. Don't talk shop to Anyone.
    Anywhere.
    Any time.
18. Don't whilst in flight make any notes on performances or shortcomings of aircraft, armament, or equipment.
    The men talking to you are enemies unless you know them personally and even then enemies may be listening.

PART V

Rights of prisoners

While it is considered probable that prisoners of war will be well treated, the attention of all ranks should be drawn to the rights of prisoners. The important rights are:

(a) Complaints can be made to the Camp Commandant.
(b) Complaints can be made to the American Consul.
(c) Correspondence and parcels within limits are permitted under censorship supervision.
(d) No person should be threatened or in any way forced to divulge information against his will.

LÉGENDES

1 Fairey Battle du No. 103 ou 105 Sqn France, 1939 en train d'être préparé pour une mission armée de reconnaissance. 2 Wellington Mk I bombardiers du No. 9 Sqn sur un vol d'avant guerre, avec un insigne de l'escadron sous la carlingue. 3 Insigne officiel du No. 9 Sqn avec un slogan officieux 'il y a toujours un truc quelconque!' 4 Membres de l'équipage d'un Wellington du No. 75 (Nouvelle Zélande) Sqn; deux d'entre eux portent des blousons Irvin. 5 Mitrailleur d'arrière d'un bombardier Wellington. 6 Wellington du No. 75 Sqn après un atterrissage forcé; la construction solide du Wellington le permettait de survivre la plupart des accidents remarquablement indemne. 7 L'équipage d'un Wellington se prépare pour une mission; observez l'homme à gauche, avec une tenue de vol Sidcot et un sac amovible à crochets pour parachute. 8 Handley Page Hampden d'une unité d'entraînement d'équipage, No. 14 O.T.U. 9, 10 Un Blenheim Mk I bombardier après une défaillance de châssis. 11 Blenheim Mk I – la carlingue; le pilote s'asseyait à gauche, et le tireur de bombes se couchait à la place à côté de lui. 12 Des mécaniciens avec un Hampden, EA-P du No. 49 Sqn à Scampton, 1941. L'insigne est illustré à la page 31. 13 Blenheim Mk IV bombardiers, Wyton juillet 1940. Notez les petits lances-bombes extérieurs sous l'appareil. 14 Hampdens du No. 14 O.T.U. en vol – le Hampden avait le petit nom de 'Têtard Volant' pour des raisons évidentes. 15 Whitley Mk V, T4261, DY-S présenté à No. 102 Sqn par le peuple de Ceylan. Il fut perdue plus tard pendant l'action. 16 Le bombardier Manchester râté; ici, un Mk Ia du No. 207 Sqn. 17 Manchester Mk I du No. 207 Sqn; notez la nageoire dorsale, supprimée sur le Mk Ia. 18 Wellington Mk II bombardiers du No, 214 Sqn; notez les moteurs Merlin. BU-V a un insigne de tête de tigre et le slogan 'Sri Guroh' sous la carlingue, il a été acheté avec des fonds réunis dans les Etats Malais. 19 Des insignes officieux au nez n'étaient pas courants au début de la guerre. 20 Whitley d'un No. 102 Sqn revient d'un raid de distribution de propagande en 1939.

21, 22 Blenheim Mk IV bombardiers du No. 139 Sqn au dessus de la France, avril 1940. 23 Wellington Mk III bombardiers d'une unité d'entraînement No. 30 O.T.U. 24 Des hommes du Luftwaffe posent avec LN-F T2501, un Wellington Ic qui les a fait atterrir en territoire ennemi. 25 Un Wellington qui fut endommagé, surveillé ici par un soldat allemand. 26 Le Boeing B-17C qui était utilisé brièvement par le RAF, nommé Fortress Mk I. Il n'avait pas de succés. Ceci est AN521 du No. 90 Sqn. 27 Un canot en caoutchouc à sept hommes rangé dans l'aile des bombardiers RAF; il se détachait automatiquement lorsque l'avion toucha l'eau. 28 L'officier aviateur Cowan avec une fille pilote de passage et son équipage du Wellington X3794, WS-V du No. 9 Sqn. L'avion s'appelle 'Barbara et Mary' en souvenir des femmes et petites amies de l'equipage. Cowan fut tué plus tard pilotant des bombardiers Lancaster.
29 L'équipage au sol du 'Barbara et Mary'; notez la position du mitrailleuse sur le côté de l'avion. 30 Short Stirling Mk I du No. 7 Sqn, le premier des bombardiers RAF lourds à quatre moteurs.

31 Whitley Mk V à l'essai le matin du 30 mai 1942; cette nuit là on l'a piloté sur le premier 'raid mille bombardiers'. Cet avion est illustré en couleur pages 28 et 29. 32 Le second des avions à quatre moteurs d'atteindre Bomber Command – un Handley Page Halifax Mk I en juillet 1942. 33 Halifax B.II Srs.1, BB324, ZA-X du No. 10 Sqn; notez les moteurs actionné de pas d'hélice. 34 Halifax TL-P, W7676 du No. 35 Sqn tomba au-dessus de Nuremberg le 28/29 août 1942. 35 Stirling N3705 MG-F du No. 7 Sqn fit un atterrissage forcé à Gorkum, en Hollande le 16 août 1942, pendant une mission de pose de mines – Sgt. Orrel et son équipage survecurent et furent capturés. Le Luftwaffe reparèrent l'avion, et le pilotèrent sur des vols d'essais à partir du 5 septembre. 36 Boston du No. 88 Sqn démarrant ses moteurs. Cet appareil américain remplaça le Blenheim pour des obligations de bombardiers légers en octobre 1941.

Notes sur les planches en couleurs

Page 25: Pilot d'un bombardier RAF, 1940. Il porte un blouson Irvin et des bottes de vol en daim par dessus des pantalons tenue de jour, une chemise et une cravate. Le justaucorps incorpore le harnais de parachuté; dans des circonstances pressantes, le parachute lui-même était attaché aux deux crochets sur la poitrine. Il porte le sac de parachute d'un camarade ainsi que le sien. Le casque de vol du type C a des couvre-écouteurs à fermeture éclair, et un masque d'oxygène incorporé au micro couvert par du tissus gris-bleu.

Page 26 en haut: No. 300 (Masovian) était le premier escadron bombardier RAF formé avec des polonais; la plupart d'eux était auparavant des pilotes chasseurs, et l'unité était formé à Bramcote en juillet 1940. Cet avion a les surfaces supérieures camouflées en marron et vert foncé, scheme A: les lettres de code en gris clair indiquent l'escadron (BH) et l'avion individuel (G). L'insigne polonais est porté au même endroit sur les deux côtés. Les cocardes sont du type B sur les surfaces supérieures de l'aile et du type A1 sur les côtés du fuselage, Les codes apparaissent comme 'BH-G' sur le côté tribord.

Page 26 en bas: Celui-ci est l'avion dans lequel le Sgt. John Hannah, âgé de 18 ans gagna la Victoria Cross pendant un raid sur les canots de débarquement la nuit du 15/16 septembre 1940. No. 83 Sqn était basé à Scampton à l'époque. Les codes apparaissent comme 'W-OL' sur le côté tribord. Des cocardes sont du type B sur les surfaces supérieures des ailes, et du type A1 sur les côtés du fuselage.

Page 27: Certains avions de cet escadron portèrent l'attribut d'un siphon d'eau gazeuse du No. 75 Sqn sur le nez; on ne sait pas si 'C' était de ceux-là. Les lettres de code blanches apparaissent telles 'AA-C' sur le côté tribord. Les cocardes ronds sont du type B sur les surfaces supérieures des ailes et du type A1 sur les côtés du fuselage.

Pages 28–29: Ce Whitley servait avec l'unité d'instruction No. 10 O.T.U. en mai 1942 à Abingdon. Il était piloté par un équipage des instructeurs sur le premier raid 'Mille Bombardiers' vers Cologne, les 30/31 mai 1942, et de nouveau sur le second raid à Essen le 1/2 juin. Il était piloté par Warrant Officer R. E. Griffin, qui avait déjà piloté des Whitleys du 10. Sqn pendant 30 raids avant de rejoindre le O.T.U. en juillet 1941, et on lui recompensa avec le Distinguished Flying Medal.

Page 30: Cet avion, V5899 'J' était l'un parmi les douze des Nos. 105 et 107 Sqns qui firent un raid sur les docks à Bremen en plein jour, le 4 juillet 1941. La formation était dirigée par Wing Commander Hughie Edwards, qui gagna la Victoria Cross. Comme bombardier de jour, ce Blenheim avait les surfaces inférieures camouflées couleur du ciel. L'avion d'Edwards, le 4 juillet, était peint exactement de la même façon; c'était V6028 'D'.

Page 31: L'insigne peint sur l'avion; en haut de gauche à droite: No. 9 Sqn comme sur le Wellington Mk I L4274, KA-K, 1940, sous le carlingue côté bâbord. No. 75 Sqn avait l'insigne d'un siphon sous le carlingue, côté bâbord, à côté des Wellingtons du même unité. Hampden Mk I AE238, EA-P du No. 49 Sqn, Scampton, 1941, sous le carlingue côté bâbord. En bas de gauche à droite: Manchester Mk I R5833, OL-N du No. 83 Sqn. En bas: un tracteur RAF du terrain d'aviation avec un convoi de chariots à bombes.

Pages 32 à gauche: Leading Aircraftwoman, WAAF, 1942. Plusieurs membres du service des femmes accomplèrent des tâches en mécanique afin de libérer les hommes pour les obligations de combat. Cette jeune femme porte la casquette et l'attribut de WAAF, avec une tenue de travail 'battledress'; le seul insigne porté est son attribut de rang, une hélice en bleu pâle sur un écusson bleu foncé sur les deux manches.

Page 32 à droit: RAF Bomber Command, 1941, portant de costume de vol flottable distribuée cette année. Les bottes de vol 1941 eurent plusiers couches de soie en doublure sous la peau de mouton, comme protection contre les éclats de shrapnel. Le harnais du parachute est porté ici séparement du costume, mais il y a toujours les crochets sur la poitrine pour attacher le sac de parachute. Il porte une feuille de propagande en langue française qu'il va laisser tomber au-dessus de la France occupée.

1 Ein Fairey Battle von entweder No. 103 oder No. 105 Sqn wird für einen bewaffneten Aufklärungseinatz, Frankreich 1939, vorbereitet. 2 Ein Bild noch aus des Friedenszeit; Wellington Mk I Bomber von No. 9 Sqn mit Staffelemblem unterm Kanzel. 3 Vorschriftsmässige Staffelemblem von No. 9 Sqn mit ganz unvorschriftsmassigem Wahlspruch: 'Es geht sicherlich doch etwas schief!' 4 Wellington-Mannschaft von No. 75 (New Zealand) Sqn. Zwei tragen Irvin Jacken. 5 Heck M-G Schützer einer Wellington. 6 Wellington von No. 75 Sqn nach einer Notlandung. Die robuste Bauart der Wellington könnte die stärksten Unfälle überleben. 7 Besatzung einer Wellington bei der Einsatzvorbereitung. Der Mann links mit Sidcot Fiegeranzug und anschnallbarem Fallschirmbehälter beachten 8 Handley Page Hampden eines Ausbildungsstaffels (No. 14 O.T.U.). 9, 10 Blenheim Mk I Bomber nach einem Fahrgestellzusammenbruch.

11 Kanzel einer Blenheim Mk I. Der Pilot sass links, der Bombenrichtschützer lag rechts neben ihm. 12 Bodenbedienungspersonal mit Hampden EA-P von No. 49 Sqn, Scampton, 1941. Das Emblem ist auf Seite 31 zu sehen. 13 Blenheim Mk IV, Wyton, Juli 1940. Die kleine Bombenbehälter unterm Rumpf beachten. 14 Hampdens von No. 14 O.T.U. Ganz verständlich hiess die Hampden im Volksmund 'Die fliegende Kaulquappe'. 15 Whitley Mk V, T4261, DY-S. Sie wurde dem No. 102 Sqn von der Bevölkerung Ceylons präsentiert und ging später in Kampf verloren. 16 Die unerfolgreiche Manchester bomber, hier eine Mk Ia von No. 207 Sqn. 17 Manchester Mk I von No. 207 Sqn. Die Rückenflosse (vom Mk Ia entfernt) beachten! 18 Wellington Mk II von No. 214 Sqn. Die Merlin Motoren beachten! BU-V trägt ein Tigerkopf-wappen mit Wahlspruch 'SRI GUROH' unterm Kanzel, da sie mit Gelder, die in Malaya zusammengebracht wurden, gekauft worden war. 19 Unvorschriftsmässige Rumpfembleme waren zu Kriegsbeginn selten. 20 Eine Whitley von No. 102 Sqn kehrt nach einem Flugblatteinsatz 1939 zurück.
21, 22 Blenheim Mk IV von No. 139 Sqn über Frankreich, April 1940. 23 Wellington Mk III der Ausbildungseinheit No. 30 O.T.U. 24 luftwaffe-Soldaten stolz vor der Wellington Ic, LN-F, T2501 die im Feindesland landete. 25 Eine abgesturzte Wellington. 26 Die Boeing B-17C wurde vorübergehend von der RAF, unter der Name 'Fortress Mk I' eingesetzt. Sie war nicht erfolgreich. Hier, AN521 von No. 90 Sqn. 27 Ein sieben-Mann Rettungsfloss innerhalb des Flügels einer RAF Bomber eingespeichert. Es wurde bei Notlandung auf Wasser automatisch herausgeschleudert. 28 Flying Officer Cowan mit einer weiblichen 'Fähre-Pilotin' under der Besatzung von Wellington X3794, WS-V von No. 90 Sqn. Das Flugzeug heisst 'Barbara & Mary' mach den Frauen oder Freundinnen der Besatzungsmitglieder. Cowan fiel später als Lancaster-Pilot. 29 Bodenbedienungspersonal von 'Barbara & Mary'. Die Rumpf M-G Stellen beachten! 30 Short Stirling Mk I von No. 7 Sqn. Sie war die erste schwere vier-motorige Bomber der RAF.
31 Whitley Mk V beim Überprüfung, Vormittag den 30 Mai 1942. Am selben Abend nahm das Flugzeug am ersten '1000-Bomber Luftangriff' teil. Diese Maschine ist auf den Seiten 28–29 in Farbe zu sehen. 32 Der zweite vier-motorige Bomber-Typ, dass im Dienst mit Bomber Command aufgenommen wurde. Sie ist eine Handley Page Halifax Mk I, Juli 1942. 33 Halifax B.II Serie I, BB324, ZA-X von No. 10 Sqn. Die flach gelegten Propeller beachten! 34 Halifax TL-P, W7676 von No. 35 Sqn. Sie wurde 28/29 August 1942 über Nürnberg abgeschossen. 35 Stirling N3705, MG-F von No. 7 Sqn. Sie machte zu Gorkum, Holland, am 16 August 1942 während einem Minenlegereinsatz eine Notlandung. Sergeant Orrel und seiner Besatzung überlebte und kamen in Kriegsgefangenschaft. Die Luftwaffe setzte die Maschine wieder in Stand und flog sie für Versuchszwecke ab den 5 September weiter. 36 Boston von No. 88 Sqn beim Motorenanlass. Diese amerikanische Maschine löste die Blenheim für leichten Bombenangriffe mit wirkung vom Oktober 1941 ab.

Farbtafeln

Seite 25: RAF Bomber-Pilot, 1940. Zu seinem Dienstanzug (samt Krawatte) trägt er eine Irvin-Jacke und Wildleder Fliegerstiefeln. Die Überjacke hat das Fallschirmgurtzeug eingebaut. Im Notfall wurde der Fallschirm vorne mittels der zwei Brusthaken angebracht. Er trägt zwei Fallschirme, sein eigenen und den seines Kameraden. Der Fliegerhelm 'Typ C' hat Reissverschlüsse an den Hörergehäuse und eine kombinierten Sprechanlage/Sauerstoffmaske aus blaugrauem Stoff.
Seite 26 Oben: No. 300 (Masovian) Bombenstaffel war der erste der RAF der aus Polen errichtet wurde. Die Mehrzahl dieser Mannschaften waren ursprunglich Jagdpiloten. Die Einheit wurde Juli 1940 zu Bramcote errichtet. Die Oberflächen der maschine sind in den Tarnfarben dunkelbraun/dunkelgrün (Tarnschema 'A') gestrichen worden. Die hellgrauen Staffelerkennungsbuchstaben sind 'BH', Maschinebuchstabe 'G'. Das polnische Hoheitsabzeichen erschien an beiden Rumpfseiten wie gezeigt. Die Kokarden an den Oberflächen sind vom 'Typ B', an den Rumpfseiten vom 'Typ A1'. Die Erkennungsbuchstaben auf der Steuerbordeite sing 'BH-G'.
Seite 26 Unten: Das war das Flugzeug indem der 18-Jährigen Sergeant John Hannah, in der Nacht vom 15./16 September 1940 in einem Angriffe auf die Landungsschiffe im Hafen zu Antwerpen das Victoria Cross verdiente. Die Erkennungsbuchstaben an der Steuerbordseite sind 'W-OL'. Die Kokarden sing: Oben – 'Typ B', an den seiten 'Typ A1'.
Seite 27 Einige Maschinen des 75.Kampfstaffel trugen das Sodawasser syphon Abzeichen an der Rumpfnase. Es Steht nicht fest ob das Flugz 'C' unter denen war. Die weisse Buchstaben erschienen an der Steuer bordseite als 'AA-C'. Kokardentyphen: Oben – 'B', Rumpfseiten 'A1'.
Seiten 28–29: Diese Whitley flog mit der No. 10 O.T.U. Ausbildungseinheit (aus Abingdon) im Mai 1942. Sie wurde mit einer Ausbilder Mannschaft im ersten '100-Bomber-Luftangriff' gegen Köln, 30./31 Mai eingesetzt. Auch beim nächsten '1000-Bomber-Luftangriff' gegen Essen (1./2 Juni) wurde sie eingesetzt. Der Pilot war Warrant Officer (Ofw.) R. E. Griffin (der das Distinguished Flying Medal schon besass); er hatte schon 30 uftangriffe in Whitleys vom No. 10 Sqn hinter sich, bevor er zur O.T.U. im Juli 1941 versetzt wurde.
Seite 30: Das Flugzeug V5899, 'J' griff mit elf andere Maschinen aus No. 105 und No. 107 Sqns die Hafenanlagen zu Bremen am 4 Juli 1941 an. Führer der Angriffsmaschinen war Wing Commander (Obstlt.) Hughie Edwards; ihm wurde das Victoria Cross verliehen. Als Tageslichtangriffsmaschine hat diese Blenheim him elblaue Unterseiten. Edwards Maschine (V6028 'D') hatte während dem Luftangriff am 4 Juli genau diese Tarnfarben.
Seite 31: Flugzeugembleme: Oben, von links nach rechts:– No. 9 Sqn wie auf Wellington Mk I, L4274, KA-K, unterm Kanzel, Backbordseite; 1940. No. 75 Sqn, unterm Kanzel, Backbordseite auf einigen Wellingtons dieses Staffels. Hampden Mk I, AE238, Ea-P, No. 49 Sqn, unterm Kanzel, Backbordseite. (Unten, von links nach rechts) Manchester Mk I, R5833, OL-N, No. 83 Sqn. Boston, AL290, OM-K, No. 107 Sqn. (Ganz unten) RAF Flugplatzzugmaschine mit Bombenkarren.
Seite 32 Links: Leading Aircraftwoman, WAAF, 1942. Viele Instandsetzungsarbeitsstellen wurden von Mitglieder des Frauenhilfdienstes, um die Männer für den Kampfdienst freizumachen, übernommen. Diese junge Dame trägt Kampfanzug mit WAAF Mütze und Mützenabzeichen. Ausserdem trägt sie nur ihre Dienstgradabzeichen, einen Propeller (hellblau auf dunkelblau) zu beiden Oberärmel.
Seite 32 Rechts: Bordpersonal, RAF Bomber Command, 1941. Er trägt den Schwimmfähigen Fliegeranzug, der im selbem Jahr herausgegeben wurde. Als Schutz gegen Granatensplitter, hatten die Fliegerstiefeln viele Schichten Seide unter dem Schafpelzfutter engenäht. Das Fallschirmgurtzeug wurde jetzt an und für sich getragen, die zwei Brusthaken aber, erschienen noch, um Notfalls als Anschnallpunkte für einen Fallschirm zu dienen. Er trägt Flugblätter, die über Frankreich hinausgeworfen wurden.

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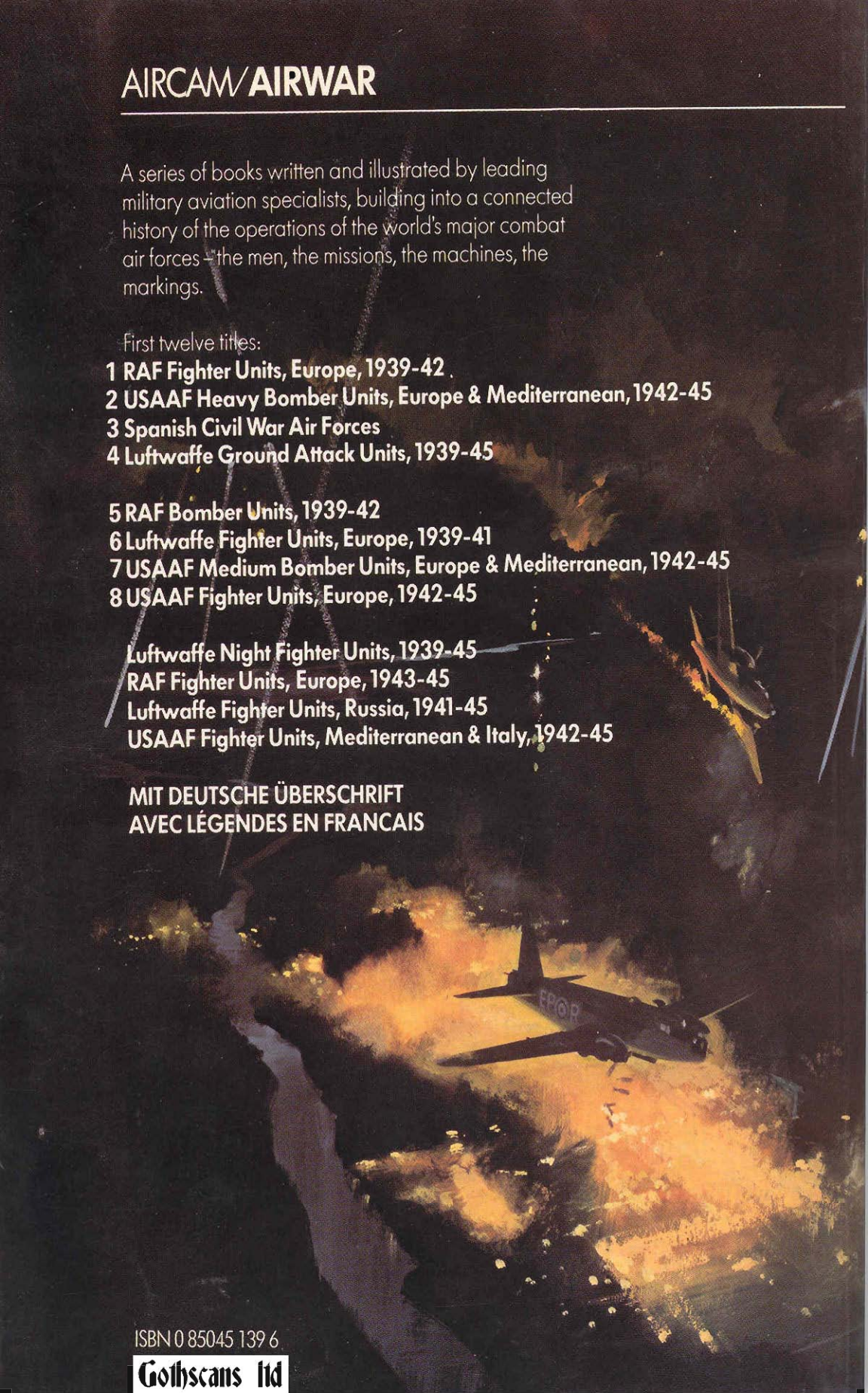

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