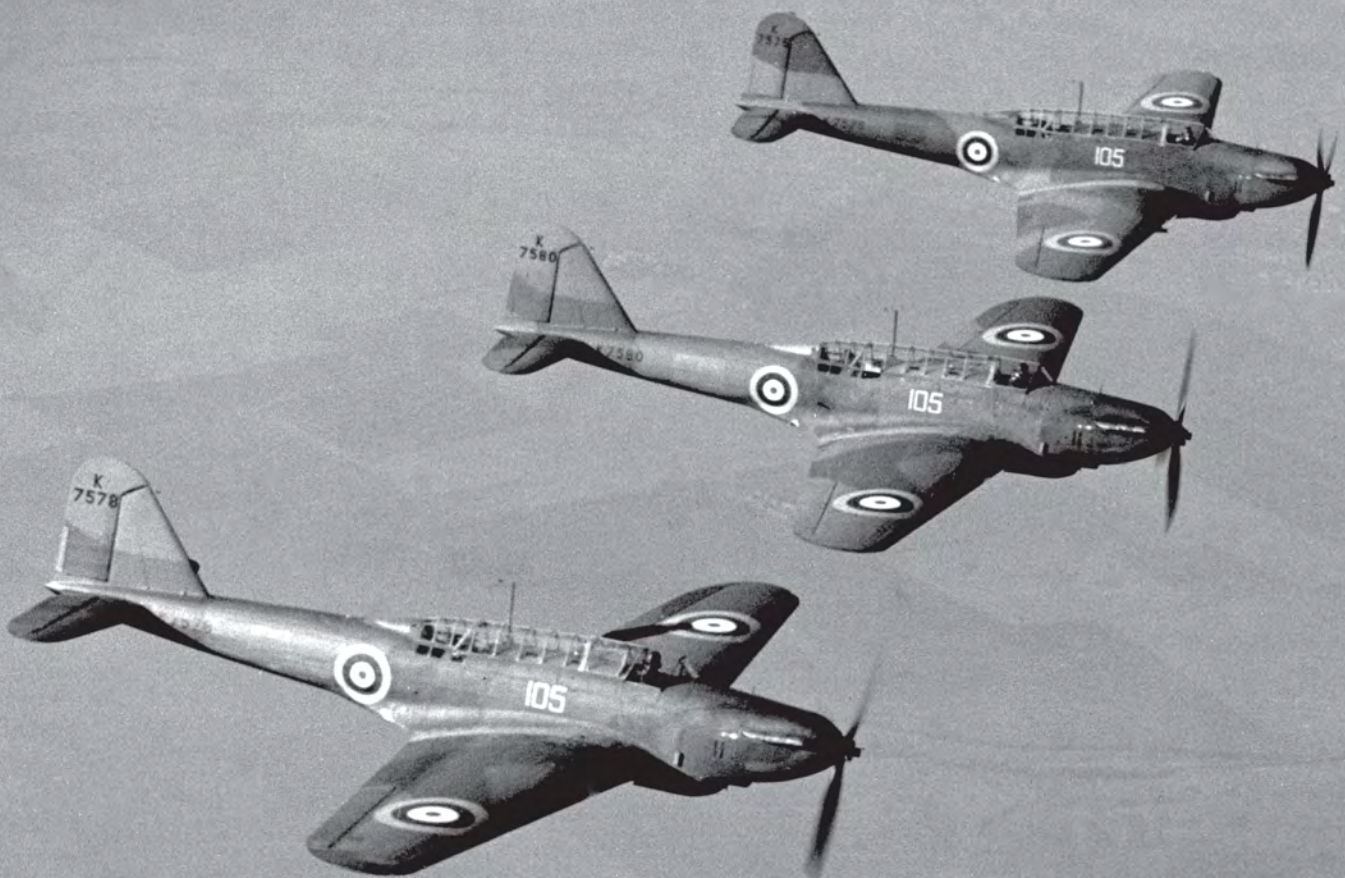


DATABASE

FAIREY BATTLE

WORDS: W. A. HARRISON



ABOVE: A trio of Battle Is – K7578, K7580 and K7575 – from No 105 Squadron formate for the camera. AEROPLANE

Page 88 LIGHT BOMBER FOR THE MONOPLANE ERA

Page 91 A STRONG, ADAPTABLE DESIGN

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Development

The need for rapid RAF expansion saw Fairey's new light bomber being ordered in quantity, despite lacklustre performance

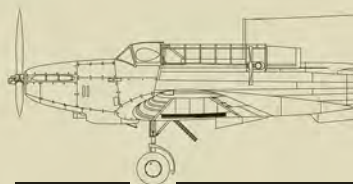
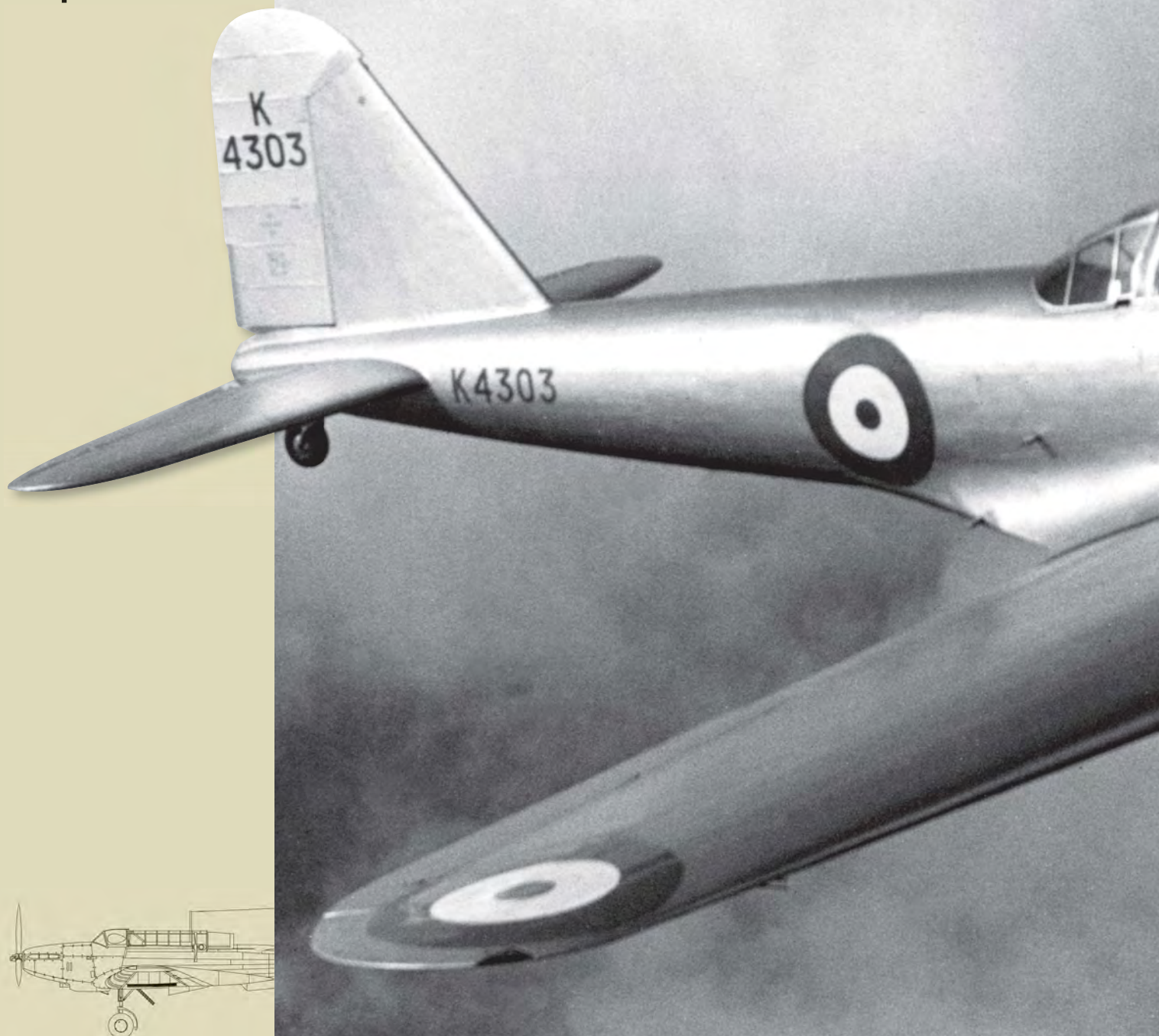
It was during August 1932 that the Battle saga really began, with an Air Ministry specification calling for studies to replace the Hawker Hart and Hind biplane bombers. The Air Staff, via operational requirement OR7, asked for a design to carry a 1,000lb bomb load for 1,000 miles at 200mph. The director of technical development offered a new specification, P27/32, which was sent out to the aircraft industry on 12 April 1933. Armstrong Whitworth, Boulton Paul, Bristol, Fairey, Gloster, Hawker, Vickers and Westland tendered designs, examined that November.

Among those offered by Fairey was a twin-engined machine with separate twin cockpits, powered by two Fairey P12 Prince engines. Performance was good with a maximum speed of over 300mph. It was turned down by the Air Ministry as outside the requirement, which sought a light bomber powered by a single engine.

The new bomber was not dissimilar in that it was to have a crew of two, pilot and observer, in their own separate cockpits. Its maximum speed was specified initially as not less than 195mph (314km/h) at 10,000ft (304.8m), and service ceiling as 22,000ft (6,147m). A combination of bomb

loads could be carried up to a maximum of 1,250lb (567kg), later altered to 1,000lb (453.6kg) over 1,000 miles (1,609.9km). Tare weight was not to exceed 6,300lb (2,857.6kg), and it was to have one 0.303in machine gun in the starboard wing, although the Air Ministry felt this would not be needed if the bombers were to fly in formation! The engine could be any British type that had passed the Service Type Test of 100 hours within a year of tendering to the specification, and the propeller could be made of wood or metal.

Fairey and Armstrong Whitworth were contracted to construct one prototype each. The Armstrong



Whitworth AW29 (serial K4299) was built, but the company had embarked on the Ensign and Whitley programmes, so it was pushed into the background. Not until 6 December 1936 did it fly. Following a wheels-up landing, the AW29 was abandoned in favour of the Whitley.

Fairey's single-engined aircraft was to be powered by the company's own Prince engine rated at 710hp. Realising that this would leave it underpowered, within a year it was being offered at a supercharged 835hp, only a bit short of the proposed Rolls-Royce Merlin II of 880hp. The Air Ministry refused to consider the Fairey unit as it

was not a recognised aero engine manufacturer. Consequently it was decided to opt for the Merlin.

The first flight of the Fairey machine — named Battle on 2 April 1936 — was delayed due to Merlin problems. Fairey's chief test pilot Flt Lt Christopher Staniland eventually got airborne in prototype K4303 at the company's Great West Aerodrome, today beneath Heathrow, on 10 March 1936. Initially Staniland accepted the type's performance but suggested some slight improvements such as modified elevators and rudder to improve handling. A little later, when it was fitted with a more powerful 1,030hp Merlin F

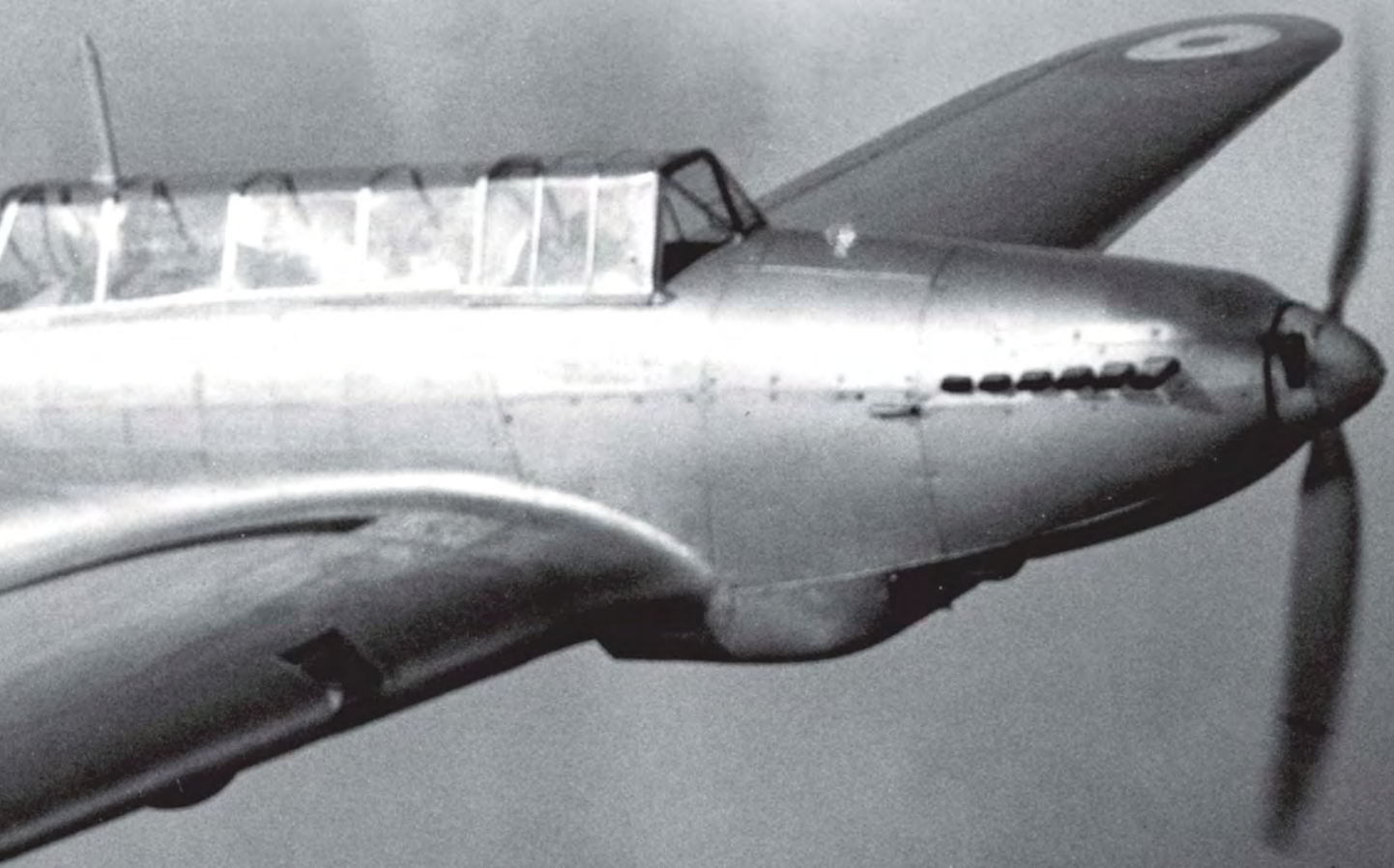
(subsequently designated Merlin I) with 'letterbox' exhaust manifolds and a two-position, three-bladed de Havilland propeller, he was more enthusiastic.

A spinner fitted to the propeller on early test flights was abandoned and Battles rarely flew with spinners after that. The canopy was redesigned to merge with the rear fuselage, making it much more attractive. The press noticed these changes when K4303 was displayed at Hendon on 27 June 1936 in the 'Special Aircraft, Past and Present' park. It had a flat wing, the introduction of slight dihedral on production machines enhancing the aircraft's ability to bank.

Initial Battle test flying was shared by Staniland and Flt Lt Duncan Menzies. K4303 was flown in July 1936 to the Aeroplane and Armament Experimental Establishment (A&AEE) at Martlesham Heath for handling and performance trials. Pilots noted that the aircraft's handling was docile throughout the speed range, although the rudder appeared to be sluggish, and general performance was disappointing. It was found to have a maximum speed of 257mph (414km/h) at 15,000ft (4,575m) with a 1,000lb (454kg) bomb load.

RAF interest waned at this stage, but political pressure and a great demand to equip newly-formed

BELOW: First prototype K4303 during a test flight in the hands of Flt Lt Christopher Staniland. AEROPLANE



DATABASE FAIREY BATTLE



ABOVE: Battles on the line at the opening of Fairey's plant at Heaton Chapel, Stockport, in June 1937. AEROPLANE

bomber squadrons with modern equipment, identified for this task under Scheme C of the service's expansion plan, overruled the Air Ministry. The first Battle order was placed in June 1935, for a substantial total of 155 aircraft. This allowed factories, including the new 'shadow' facilities, to set up for mass production ready for the advent of the new heavy bombers that were already on the drawing boards. The production Battle I was ordered to revised specification P23/35, incorporating changes from the prototype form.

With Fairey's Hayes production line already full with Swordfish and Albacores, and the planned Barracuda to come, a factory complex was set up at Heaton Chapel in Stockport, with final assembly and test flying carried

Fairey Battle I and II specifications

POWERPLANT

One Rolls-Royce Merlin I (Battle I) or Merlin II (Battle II), 1,030hp

DIMENSIONS

Length: 42ft 4in (12.9m)
 Height: 15ft (4.57m)
 Span: 54ft 0in (16.46m)

WEIGHTS

Empty: 6,647lb (3,015kg)
 Max take-off: 10,792lb (4,895kg)

PERFORMANCE

Maximum speed (15,000ft): 257mph (407km/h)
 Service ceiling: 25,000ft (7,620m)
 Range: 1,100 miles (1,769m) at 200mph and 16,000ft

ARMAMENT

One 0.303in (7.62cm) machine gun in starboard wing
 One Vickers 0.303in (7.62cm) machine gun in rear cockpit
 Four 250lb (113.4kg) bombs in recessed wing bays
 Two 250lb (113.4kg) bombs under each outer wing panel

out from the new Manchester airport at Ringway. However, prior to the opening of Ringway the first 21 flights by Battles were carried out at nearby Barton. On 14 April 1937, Menzies, the chief production test pilot at the northern complex, took initial production Battle I K7558 on its maiden flight. Ringway was opened on 8 June 1937 with Menzies giving a spirited display in Battle K7563.

The Air Ministry approached Austin Motors in February 1936 about manufacturing Battle wings, and in 1938 complete aircraft. For test flying an airstrip was prepared at Northfield, almost alongside the plant at Longbridge in Birmingham. However, in winter it would not be suitable for test flying, so on their first flights the Battles were ferried to RAF Castle Bromwich where testing could take place.

Chief test pilot for Austin was Capt Neville Stack AFC, who had a small team including Jim Mollison to help him. The first Austin-built Battle L4935 was flown from Northfield on 22 July 1938. The initial 59 Battles to emerge from the Austin plant were powered by the Merlin II, followed by the Merlin III, which became the type's standard engine (although some aircraft in service used the improved Merlin IV and V).

Production at Heaton Chapel started in May 1937 and ended in November 1940, while at Austin it began in October 1938 and ran until October 1940. The figures usually quoted state that 2,201 Battles were built. However, Ministry of Aircraft Production records show the following:

Year	Fairey	Austin	Total
1937	81	-	81
1938	352	28	380
1939	513	524	1,037
1940	218	480	698
	1,164	1,032	2,198

BELOW: The Battle's debut in the 'Special Aircraft, Past and Present' park at Hendon's RAF Display in 1936. AEROPLANE



Technical Details



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To the Battle design's credit, it was strong and adaptable

ABOVE: An early Battle undergoes work at Heaton Chapel. Chalked on the fuselage side just below the cockpit are the words 'Out of bounds to all ranks and civilians'. AEROPLANE

The final design, by Marcel Lobelle, a domiciled Belgian who had become head of the Fairey design team, was elegant and streamlined with the crew under one long, continuous canopy. It resulted in a remarkably robust, easy-to-build airframe, which proved simple to fly and at the same time adaptable for other roles. It was the first Fairey aircraft to use light alloy stressed skin.

The monocoque oval-section airframe was built up of light alloy hoop frames pressed out in single pieces, each notched to receive the four special longerons and pre-formed skin plating. The skin plating was unique, being cut to form strips of clinker construction, with the upper edge rolled to create an integral U-shaped stringer. After the first strip of fuselage skin had been attached to the frames, the next was applied with a small overlap on the previous skin, along which a rivet line was centred. This method of construction saved the weight of numerous rivet lines, which would have attached the separate stringers had they been used.

Four longerons, arranged in upper and lower pairs, ran for three-quarters of the length of the fuselage, with the inner flanges of each longeron connected to each

frame with small brackets. A butted flat skin joint was fitted above each longeron, closure being made by a double rivet line through the skin and the outer flange on both sides of the longeron. The rear monocoque portion of the fuselage was built separately from the centre section of the mainplane.

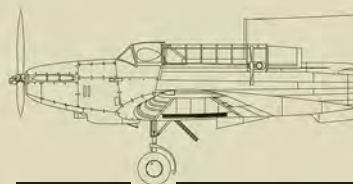
The rest of the fuselage structure consisted of doubling up some of the frames in the tail cone for the fixing of brackets to which the fin and rudder could be bolted. The fuselage ahead of the pilot's bulkhead comprised a steel tube structure supporting the pilot's cockpit flooring and fireproof bulkhead. The fuselage profile was formed by light alloy subframes and sections; fixed and detachable panels were fitted to them. A small centre section was made up of two short lengths of spar, built from light alloy box sections into a girder structure joining four heavy wing ribs. The internal spaces formed by the two pairs of ribs at the outboard ends each housed a 106-gallon fuel tank, while the larger space between the inner ribs formed the bomb aimer's compartment, which was entered from the cockpit interior.

The outer wing panels were of two-spar construction, the inner ends being of girder form, changing to flanged beams on the outboard

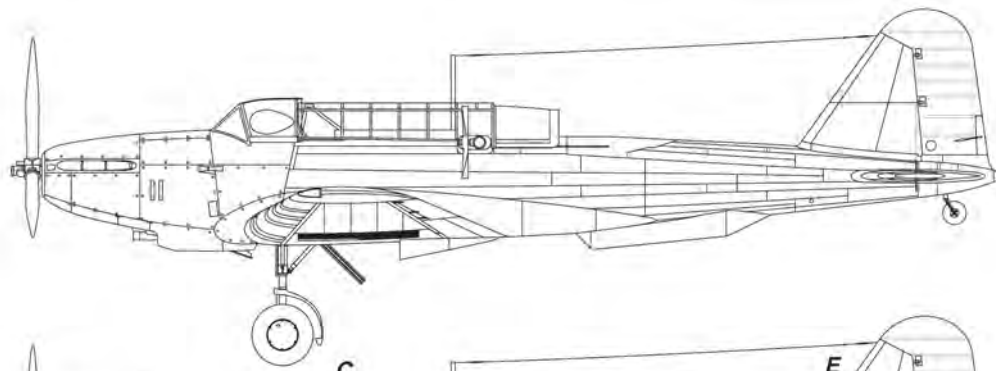
sections. Wing ribs containing large circular flanged lightening holes were further strengthened by deep-edged flanges pressed from light alloy and attached to the spars by means of angle brackets. The wing ribs supported continuous Z-section span-wise stringers, separate from the wing skinning. A light alloy wing skin was applied in long, flat strips, overlapping as on the fuselage skins, with single rows of rivets through the overlap and Z-stringer below. All the moveable control surfaces were fabric-covered metal frames.

Split trailing-edge flaps were of metal and connected at their inner ends via universal joints. A hydraulic system provided power for flaps, main undercarriage and bomb mounting crutches. The latter allowed the bombs to be lowered clear of the wings when dive-bombing.

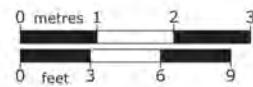
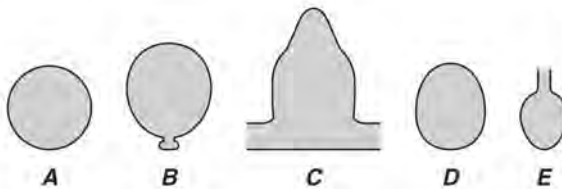
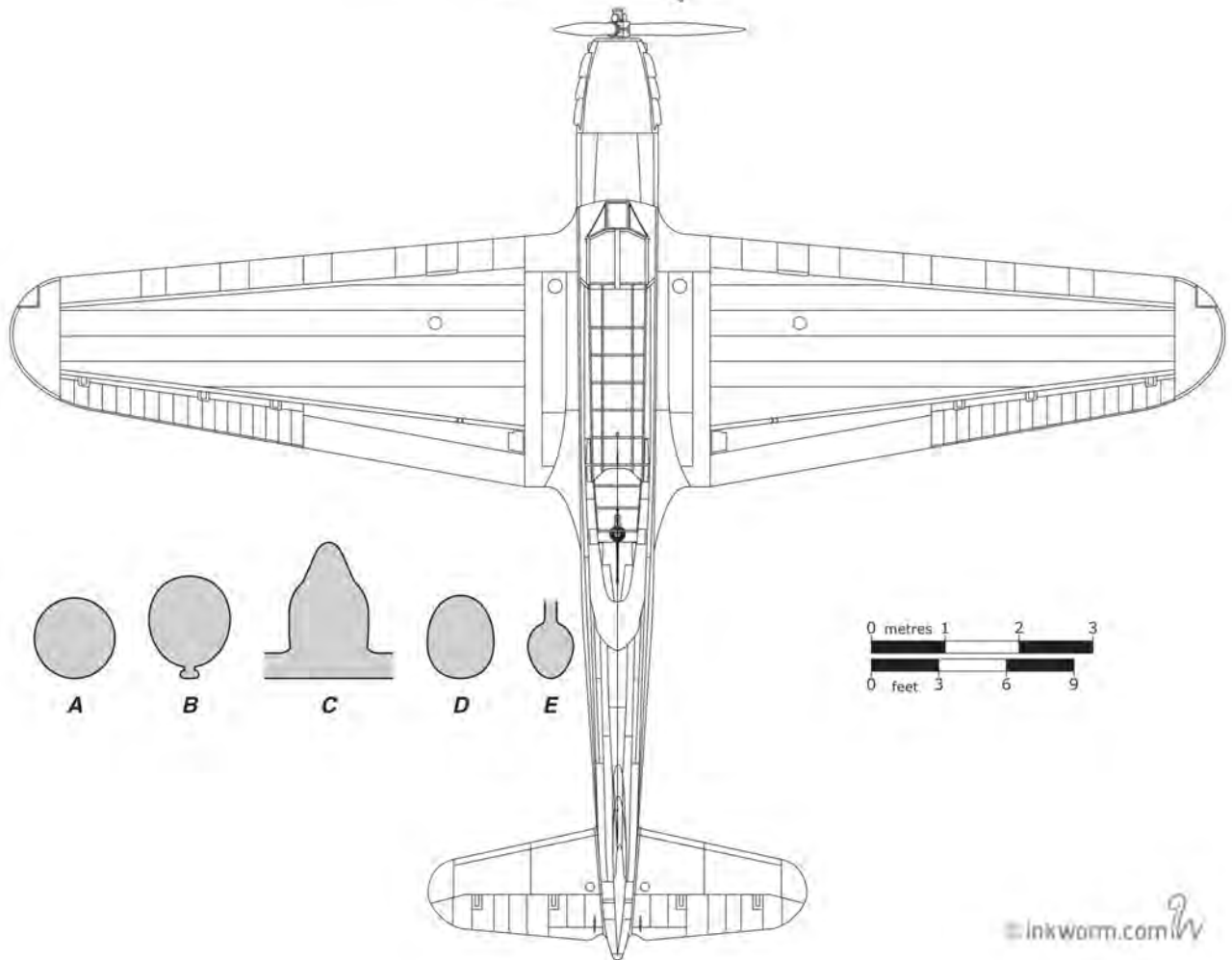
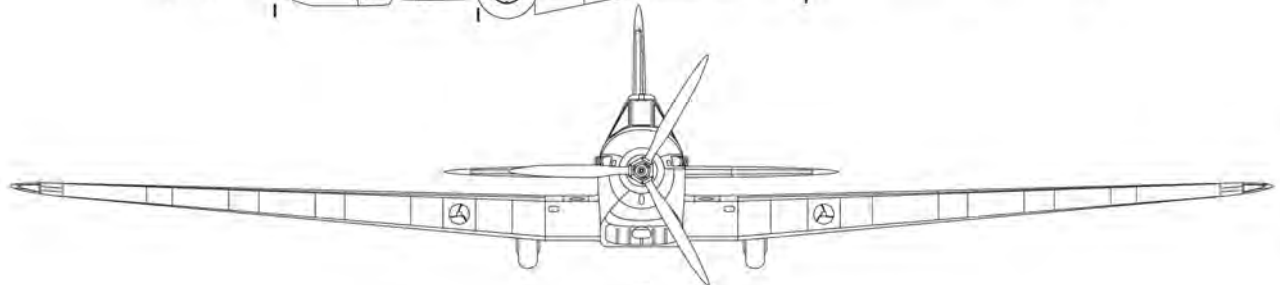
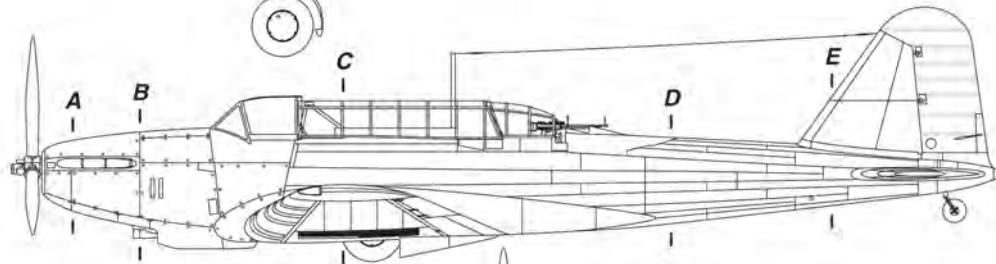
A single fixed gun, usually a Vickers 0.303in (7.62mm) machine gun, was installed in the starboard wing. A single 0.303in Vickers K gun was carried on a special mounting aft of the rear cockpit. The partially successful fitting of a Vickers K beneath the bomb aimer's panel to cover the blind spot was not universal, and only fitted as a field modification to a number of Battles in action over France in 1940. **A**



Battle
Target Tug



Battle I





ABOVE: Battle Is K7595, '6 and '7 from No 226 Squadron, stationed at Upper Heyford in Oxfordshire. The unit started replacing the Hawker Audax with the new type in October 1937. AEROPLANE

When action came, there was no hiding the Battle's shortcomings, despite the heroics of the type's crews

The RAF was still operating a largely biplane force in 1936. Pending introduction of the Battle with its retractable undercarriage, hydraulic flaps, variable-pitch propeller and powerful engine, Fairey's design office came up with a dual-control conversion trainer. Consequently, the second production Battle, K7559, had already been converted when it was delivered to No 63 Squadron at RAF Upwood on 20 May 1937 — the first example for the RAF. Duncan Menzies went along to instruct Sqn Ldr Parker, 63's CO, on the intricacies of a modern-day single-engined bomber. Three Battles (K7562, K7563 and K7566) were immediately involved in intensive operating trials.

The new aircraft created a lot of interest, the unit acting as ambassadors to the media and hosts to representatives from Belgium,

China, Egypt, Italy and Germany — the latter were more interested in the details than buying the type. In August 1937 nine of 63's Battles, and their crews, became film stars when Gaumont-British visited Upwood to make 'Under the Shadow of the Wing'. Night flying took place during March 1938 and the squadron engaged in air defence exercises. During that autumn's Munich Crisis the squadron went onto stand-by for war mobilisation.

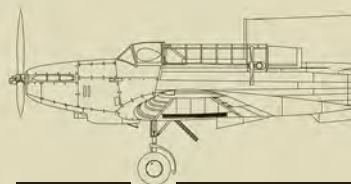
Early Battles powered by the Merlin I were replaced in December 1938 by Merlin II-engined MkII aircraft, and by February 1939 the squadron had a full complement of 21 such machines. However, 63 was not to go to war, being transferred to the training role. In April 1940 it merged with No 52 Squadron and the Station HQ at Benson to form No 12 Operational Training Unit.

By then many other squadrons had received Battles. In 1937 the

next to convert was No 88, and 13 more took the type on during 1938 — Nos 218, 12, 35, 207, 98, XV, 142, 40, 103, 106, 57, 150 and 185. The Air Ministry had decided to make No 1 Group of Bomber Command an all-Battle outfit, consisting of Nos 12 and 142 Squadrons at Bicester, XV and 40 at Abingdon, 88 and 218 at Boscombe Down, 103 and 150 at Benson, and 105 and 226 at Harwell. Another five squadrons went to No 2 Group — 35 and 207 at Cottesmore, 52 and 63 at Upwood, and 98 at Hucknall. Nos 106 and 185 Squadrons joined No 5 Group at Thornaby, but by mid-1939 eight squadrons from Nos 2 and 5 Groups were transferred to No 6 Group, a Bomber Command training group that would provide the core of the Operational Training Units which sprang up in 1940.

On 10 November 1937 ACM Sir Edgar Ludlow-Hewitt, commander-

BELOW: Period colour shots of Battles are very rare. This one depicts MkI K7581 during use as a 'hack' by No 3 Squadron, with camouflaged Gladiators from the unit in the background. AVIATION-IMAGES.COM



DATABASE FAIREY BATTLE

in-chief of Bomber Command, wrote a letter to the Chief of the Air Staff, Sir Cyril Newall, stating: "The bomber force as a weapon of war is deplorably inefficient". He cited how the firepower of fighters had increased four-fold while bomber armament had remained almost

unchanged. "On its intended role as a tactical bomber in the field operating in close co-operation with ground forces and supported by units of Fighter Command", Ludlow-Hewitt continued, "the Fairey Battle is a highly respected aeroplane."

Note that he said "supported by units of Fighter Command..." Only two Hawker Hurricane squadrons were allotted for escort duties in France, Nos 1 and 73. Once the war started these Hurricanes were frequently intercepted by enemy fighters and quite often rendered

unable to provide cover. This left Battle squadrons to operate in daylight, on their own, at low level. With lack of speed and inadequate defensive armament it was obvious that Battle sorties would have a high casualty rate, which is exactly what happened.

TO WAR IN FRANCE



ABOVE: Battle pilots from an unidentified unit assigned to the Advanced Air Striking Force in France walk to their aircraft on 13 January 1940. PRESS ASSOCIATION IMAGES

In the event of hostilities with Germany, the RAF had agreed with the French to provide two separate air commands within France. January 1939 records show that 459 Battles and 485 Bristol Blenheims were available, so there was no shortage of light bombers.

The light bomber units of the Advanced Air Striking Force (AASF) were to remain part of Bomber Command but be located in France, within range of the German border. The French high command was horrified that the Germans could

retaliate, and all but insisted that the AASF's aircraft be used to stem any attacks by German ground forces through the continuous medium and low-level bombing of motorised columns, troop movements, communication centres, storage depots and, when possible, enemy airfields.

The other command, the Air Component of the Field Force (ACFF), had light bombers, fighters and army co-operation units to provide aerial protection for British Army units in France. On 24 August

1939, pre-empting the rapidly deteriorating political situation, the British authorities ordered the mobilisation of No 1 Group squadrons with immediate effect. The AASF flew out on 2 September 1939 to bases in Champagne country.

Squadrons French base

XV and 40	Bétheniville
103 and 150	Challerange
12 and 142	Berry-au-Bac
88 and 218	Auberive
105 and 226	Reims

The Germans, for some reason, did not immediately pursue a bombing offensive. This gave the Allies time to become established with tactical exercises, formation flying and armed reconnaissance over the Siegfried Line during what became known as the 'phony war'. The British units were re-formed into five wings, each with one squadron dispersed to a satellite airfield to keep it safe from bombing.

No 71 Wing

No 40 Squadron at Bétheniville
No XV Squadron at Condé-Vraux

No 72 Wing

No 226 Squadron at Reims
No 105 Squadron at Villeneuve-les-Vertus

No 74 Wing

No 103 Squadron at Challerange
No 150 Squadron at Écury-sur-Cooles

No 75 Wing

No 218 Squadron at Auberive
No 88 Squadron at Mourmelon-le-Grand

No 76 Wing

No 12 Squadron at Berry-au-Bac
No 142 Squadron at Plivot

These, it turned out, were only temporary bases. Squadrons were moved time and again, sometimes because the Armée de l'Air wanted a base itself, or if an airfield became unserviceable. Nos XV and 40 Squadrons returned to the UK in December to re-equip with Blenheims.

On 30 September 1939, No 150 Squadron sent out five Battles



ABOVE: Wrecked No 142 Squadron Battles litter Berry-au-Bac airfield near Reims after the German onslaught. AEROPLANE



ABOVE: Armée de l'Air Curtiss Hawk 75A-1 fighters from Groupe de Chase 1/5 at Suippes escort No 88 Squadron Battles. AEROPLANE

VC WINNERS



Fairey Battle I P2204
No 12 Squadron, RAF
 CHRIS SANDHAM-BAILEY

The action against bridges on 12 May 1940 led to two members of a Battle crew from No 12 Squadron, pilot Fg Off Donald Edward Garland and navigator Sgt Thomas Gray, being awarded the Victoria Cross. In serial P2204, they were leading five Battles in an attack on a bridge over the Albert Canal at Veldwezelt, Belgium.

In the words of the citation, "All the aircrews of the squadron concerned volunteered for the operation, and, after five crews had been selected by drawing lots, the attack was delivered at low altitude against this vital target. Orders were issued that this bridge was to be destroyed at all costs. As had been expected, exceptionally intense machine-gun and anti-aircraft fire were encountered. Moreover, the bridge area was heavily protected by enemy fighters. In spite of this, the formation successfully delivered a dive-bombing attack from the lowest practicable altitude. British fighters in the vicinity reported that the target was obscured by the bombs bursting

on it and near it. Only one of the five aircraft concerned returned from this mission. The pilot of this aircraft reports that besides being subjected to extremely heavy anti-aircraft fire, through which they dived to attack the objective, our aircraft were also attacked by a large number of enemy fighters after they had released their bombs on the target. Much of the success of this vital operation must be attributed to the formation leader, Flying Officer Garland, and to the coolness and resource of Sergeant Gray, who in most difficult conditions navigated Flying Officer Garland's aircraft in such a manner that the whole formation was able successfully to attack the target in spite of subsequent heavy losses. Flying Officer Garland and Sergeant Gray did not return."

Incidentally, their gunner, LAC Lawrence Reynolds, received no decoration on the grounds that his contribution was not material to the outcome of the mission. **Ben Dunnell**

to find a heavily-defended enemy position in the Saar. They were intercepted by 15 Messerschmitt Bf 109s, three Battles being shot down while the other two force-landed. Henceforth, the Battles were withdrawn from daylight low-level operations without a fighter escort. Blenheim squadrons undertook many of the necessary daylight reconnaissance flights, and it was March 1940 before Battles returned to the fray, but even then only carrying out night leaflet raids along the Rhine.

Battle crews in France were unhappy about their vulnerability to attacks from the rear and below, and numerous field modifications were trialled. The installation at least gave the crews some confidence that they could hit back in the blind spot.

With heavy snowfalls and freezing temperatures, the weather in the winter of 1939-40 was the worst in recent memory, with grass airfields becoming almost unusable. Upon the thaw, the 'phoney war' was over.

The Germans began their long-expected attack through the Ardennes and Luxembourg towards Sedan during the early hours of 10 May. Another force crossed into the Netherlands and Belgium, with parachute troops and commandos taking important bridges, while a glider-borne attack was made on the supposedly impregnable fortress at Eben-Emael. The Luftwaffe bombed some of the AASF

airfields in France, Belgium and the Netherlands but achieved little damage, destroying three Battles at Mourmelon.

The French would still not allow Britain's bombers to overfly enemy positions, so that afternoon Air Marshal Barratt took things into his own hands and ordered AASF squadrons into action. Battle units, apart from No 88 Squadron, carried out low-level attacks on German columns moving up through Luxembourg. Hits were seen on military vehicles but ground fire accounted for 13 of the 32 attacking Battles. The rest were damaged.

Subsequent actions were little better. On 11 May, Nos 88 and 218 Squadrons sent eight Battles to attack enemy forces in Luxembourg but lost seven, the other force-landing. The next day, to try and stem the German advance all AASF squadrons were ordered to attack vital bridges, enemy armoured columns and transports. Of 23 Battles operating 11 went missing, five of them from No 12 Squadron alone — all the unit had sent. The Blenheims fared similarly badly, seven out of nine being downed.

With the low-level approach abandoned, Nos 103 and 150 Squadrons despatched 10 Battles in the early hours of 14 May to attack German pontoon bridges near Sedan. The Bf 109s did not materialise. That afternoon things were different. The entire

Battle force took off to attack gun positions, enemy-held bridges and moving columns between Sedan and Givonne. The Luftwaffe had been alerted and intercepted them. No 12 Squadron lost four Battles out of five, 88 one out of 10, 103 three out of eight, 105 four out of four, 142 four out of eight, 150 four out of four, 218 ten out of 11, and 226 three out of six. Of 63 Battles despatched, 35 did not return. Add to these the loss of five out of eight Blenheims from Nos 114 and 139 Squadrons and the situation was totally unsustainable, with further casualties suffered when the Luftwaffe bombed RAF bases.

High command decided that Battles would not now operate during daylight hours. All the AASF airfields were being threatened by the rapid German advance. A number of the Battle bases were bombed on 15 May, resulting in two squadrons moving further south and the rest following a day later. Crews were told that they were going night bombing, even though many had very little relevant experience.

Barratt appealed to his superiors for more support, but this was refused. With the Blenheim squadrons licking their wounds, on 19 May he had no choice but to send out his Battles on daylight operations. At the last minute he was granted an escort of 26 Hurricanes — unheard-of! Seven

Battle squadrons (12, 88, 103, 142, 150, 218 and 226) flew at least 33 aircraft. It was a better day — just six were lost, including all three from 142.

The Dunkirk evacuation began on 25 May. Due to the seriousness of the situation, the Battle squadrons were again tasked in daylight. No 12 Squadron bombed Panzer units, 88 attacked targets near Abbeville, 103 hit front-line troops, 150 had MT on the Abbeville road as their objective, and 226 struck enemy positions.

Intelligence had been informed that 20 senior Luftwaffe officers would be at Château Roumont near Ochamps airfield for a meeting on the morning of 26 May, and Battles were briefed to bomb it. Hurricanes from Nos 1 and 73 Squadrons were to provide cover. It was pouring with rain but four Battles of No 103 Squadron, four from 142 and two from 150 carried out their attack and observed a number of hits.

During early June the Battles saw action in an effort to help British ground forces as they retreated. Battles made one last bombing raid on 15 June, after which the surviving 48 aircraft flew back to the UK. France surrendered on 22 June.

Figures for Battle losses during the campaign vary. Records are poor to non-existent but the number has been quoted as 137, although it may seem like more.

BATTLE OF BRITAIN

The Air Ministry, alarmed as Germany began to fill the Channel ports with invasion barges, re-formed No 1 Group of Bomber Command on 18 June 1940. With few aircraft available, it was decided that four Battle squadrons would be made up from those that had returned to the UK from France, and used for night attacks. Group HQ was located at Hucknall, with Nos 12 and 142 Squadrons based at Binbrook, and 103 and 150 at

Newton. Approximately 45 Battles were available with 55 crews. To these were added the Battles of Polish-manned Nos 300 and 301 Squadrons, which had formed up at Bramcote and moved to Swinderby.

On the night of 21-22 July, armed with 250lb bombs, three Battles of 103 and three from 150 went to hit oil storage tanks at Rotterdam. However, poor weather in the target area resulted in no hits. Through the rest of July small formations of Battles conducted

attacks on enemy airfields at Brussels, Evere, Hingene and Schiphol, but to little effect.

Nos 12 and 142 Squadrons were attached to No 16 Group, Coastal Command, between 7 August and 6 September 1940. Operating from Eastchurch they sent out six Battles each to attack enemy shipping in Boulogne harbour. The following night it was Kriegsmarine E-boats. Throughout August raids were mounted against shipping there; the Luftwaffe returned the favour by

bombing Eastchurch and destroying some of the Battles.

The pattern continued into September, the No 1 Group Battles striking the harbour in Boulogne on several more occasions, plus that of Calais, and gun positions at Cap Gris Nez. Their operations ceased on 15-16 October. Between July and October 1940 the six Battle squadrons flew 289 sorties for a loss of six aircraft. The last of them to relinquish the type did so that December.

TRAINERS AND TARGET TUGS

Fairey initially offered a pre-assembled dual control conversion kit to allow Battle units to set up their own trainers until purpose-built examples became available. This consisted of a reinforced floor section on which was mounted an adjustable seat, control column, rudder pedals, throttle box and compass mounting. A speaking tube was provided between the two pilots but other cockpit items were not duplicated.

To install the unit it was necessary to remove from the navigator's cockpit the backrest on the centre section coaming, the mat and footrests on the top skin of the wing centre section and the elevator servo motor for the auto controls, plus a few other minor items. Also taken out were the wireless operator's folding seat and the gunner's seat and machine gun. At frame 7 an instrument panel was fitted in the place previously occupied by the headrest and handrail. For this type of conversion it was also necessary to remove the gunner's canopy. The front pilot's sliding canopy could be replaced with a slightly modified type, which incorporated a collapsible canvas metal-framed blind flying hood.

Second production machine K7559 became the first to be fitted with the conversion set. On 20 May 1937 Duncan Menzies flew it from Barton to Upwood for No 63 Squadron. Thereafter, as Battles were allocated to the newly-equipped squadrons at least one aircraft would be thus configured.

The first Battle T (Trainer) proper, P2277, was easily distinguished by its two individual cockpits. Menzies carried out its maiden flight at Ringway on 27 October 1939 and the inaugural full dual control test on 30 November.

A trial installation of target-towing equipment was made by Fairey in Battle K7587 during July 1939, followed by a prototype conversion of Austin-built L5598 early in 1940. That May it went to the Armament Flight at RAE Farnborough to test its suitability for the role. A Type B winch was installed in the rear cockpit with 7,000ft of steel cable. A Type D triple drum winch could also be fitted with three 1,200ft spools of cable. Three flag targets were carried in a special fairing beneath the rear fuselage. Austin built 200 Battle target-tugs, which had extensive modifications to the rear fuselage.



ABOVE: Hits on a drogue target being inspected at No 9 Bombing and Gunnery School at Penrhos, with Battle I L5251 behind. AEROPLANE



ABOVE: Twin-cockpit Battle Trainer P6728, operated by No 1 Service Flying Training School from Netheravon. AVIATION-IMAGES.COM

BATTLES OVERSEAS

AUSTRALIA

The initial four Royal Australian Air Force Battles, serials P2167, P2169, P5239 and P5247, were sent to No 1 Aircraft Park at Geelong on 30 April 1940. Flt Lt J. Lerew test-flew the first to be assembled, P5239, on 29 June. Deliveries steadily increased until the 366th and last example, target tug V1202, was received at No 2 Aircraft Park, Bankstown, on 7 December 1943.

The dual-control Battle Trainer was given the nickname 'Camel' by the Aussies.

Many of the instructors on exchange duty came from the squadrons that served in the Low Countries. For instance, Plt Off R. Givens was with No 88 Squadron during 1940, flying K9297 in combat over France. He piloted the same Battle in Australia as an instructor.

The majority of the Battles delivered to Australia were used by Bombing and Gunnery Schools. Most had been sent to scrapyards by early 1944.

BELGIUM

On 27 April 1936, shortly after the first prototype Battle had flown, three Belgian Air Force officers — Maj Kervyn, Maj Leboutte and Lt de Spoelberch

— were given individual flight experience in K4303 at the Great West Aerodrome by Fairey test pilot Duncan Menzies. On 19 June 1937 Menzies demonstrated Battle K7561 to the Belgian Air Ministry staff at Evere near Brussels. This resulted in an initial order for 16 Battles, released from production at Heaton Chapel by the Air Ministry (and not built under licence as some sources suggest).

The aircraft were test-flown in bare metal. The only external difference to the RAF machines was an extended radiator air intake beneath the nose and six separate exhaust stacks on each side of the engine cowling instead of the RAF letterbox type.

In 1938 Belgian Air Force pilots collected the first five of their Battles. They were photographed in formation from a Fairey Swordfish, after which they flew to Evere where they equipped the 5ème and 7ème Escadrille of the IIIème Groupe. There was just time for crews to familiarise themselves with their new aircraft before war was declared on 3 September 1939.

Records show that 11 Battles were available to contend the Luftwaffe on 10 May 1940 — two had been lost in accidents, two were involved in ground collisions and one was under maintenance. The remainder were flown to a landing ground at Belsele to avoid air attacks, but serial T66 was destroyed there by enemy bombers. The Battles then moved to Aalter.

In an effort to slow down the German advance, nine Battles were ordered to bomb three bridges over the Albert Canal at Maastricht on 11 May 1940. Near Gent they ran into a formation of Dornier Do 17 bombers. Battle T60 attacked them but both crew members were wounded and the aircraft force-landed near Lebbeke. T58 was shot down by three Bf 109s and the crew of T73, after reaching the bridge at Veldwezelt, found that the bomb release mechanism was not working. A second run amid intense flak resulted in a near-miss, the Battle escaping at low level. The second formation, consisting of T61, T64 and T67, was sent to the bridge at Vroenhoven. One aircraft dropped its bombs alongside the bridge but the other two had hang-ups. T61 and T67 made another attack but were shot down by flak. The third flight, made up of T62, T65 and T71, made for Briedgen. Unfortunately T71 was hit by ground fire from its own side and, with his observer in a poor way, the pilot abandoned the mission. T62 was also hit and the crew bailed out successfully. Shot at repeatedly as it approached the bridge, T65's



ABOVE: A tight nine-ship Battle formation mounted by the IIIème Groupe. BRUSSELS AIR MUSEUM ARCHIVES



ABOVE: Newly-delivered Belgian Air Force Battles on parade at Evere — note the military band at right. BRUSSELS AIR MUSEUM ARCHIVES

pilot dropped his bombs and then ordered the observer to bail out, after which he made a forced landing and escaped.

Only a few Belgian Battles were now left, joined by P2353 from No 266 Squadron, RAF, which had gone to attack enemy columns but been damaged by flak and force-landed near Brussels. It could not be flown, however, because the RAF and the Belgian Air Force used different fuel octane ratings. The Luftwaffe finished off the remaining Belgian Air Force Battles on 18 May 1940.

CANADA

The Empire Air Training Scheme (EATS), later renamed the British Commonwealth Air Training Plan (BCATP) and known to the Canadians as the Joint Air Training Plan (JATP), saw further use of the type. The Royal Canadian Air Force was allocated 754 Battles, of which

560 were given RCAF serials 1301-1320 and 1601-2140.

Of the 740 actually delivered, 632 were bombers, 85 trainers and 28 target-tugs. Ten had been lost in transit at sea. Four destined for Canada were diverted to Australia. Later on the RCAF converted 102 of the bombers into target tugs. Some of the aircraft still had dual controls fitted. Fairchild in Québec modified more than 200 Battles to become gunnery turret trainers. Received as ground instructional airframes were seven ex-RAF Battles, a further 46 being downgraded by the RCAF later.

The vast training organisation required for the needs of the British and Commonwealth air forces was eventually made up of four Training Commands: No 1 in Toronto, No 2 in Winnipeg, No 3 in Montréal and No 4 in Calgary. Under their command were 11 Bombing and Gunnery Schools, most using

Battles at some stage. The last were seemingly with No 9 B&GS at Mont Joli, Québec, which still had some 75 Battles on strength when activities ceased on 30 April 1945.

FINLAND

Pleas to the British Government for aircraft during the Finnish/Soviet war resulted in the Air Ministry releasing 20 ex-RAF Battles for delivery to Finland from January to March 1940. However, with the end of hostilities there, none were delivered.

GREECE

In 1939 the Royal Hellenic Air Force (RHAF) ordered nine Battles. P6607 to P6615 were released off the production line, but the British government cancelled the order and the aircraft were reinstated for the RAF. Then, in an about-face Britain changed its decision and agreed to supply 12 examples, P6604 to P6615, although P6614 ended up being retained by the RAF. Deliveries began on 21 February 1940 and were completed by 2 April 1940, with RHAF serials B271 to B282 allocated. They were in standard RAF camouflage with Greek roundels but no fin flash. Once in Greece they formed 33 Mira (squadron) of Combat Command.

Italy invaded Greece through Albania on 28 October 1940 and 33 Mira, based at Kouklaino, was soon in action against the Italian forces. Four

BELOW: A rank of Battles belonging to No 4 Bombing and Gunnery School at RCAF Station Fingal in Ontario. VIA LARRY MILBERRY





ABOVE: Just one Battle, R7439, was modified to MkII standard by Fairchild in Québec with a Wright R-1820 radial engine for trials in case Merlin supplies were disrupted. VIA LARRY MILBERRY

Battles bombed the airfield at Koritza North on 15 November, destroying a Caproni Ca 133 and damaging four fighters for no losses. Two Battles and two Blenheims hit Koritza South but were intercepted by Fiat CR42 biplane fighters. Battle B272 piloted by Sgt Arnides and B276 in the hands of 2nd Lt Kondides were shot down, the two pilots and one observer being killed. Capt Pitsikas's Battle B274 was badly damaged, and although he managed to fly back to base his observer, 2nd Lt Papis, later died from his wounds.

The Greek counter-offensive began during November. Three Battles attacked a retreating Italian column between Koritza and Pogradets on the 22nd. The CO of 33 Mira, Lt Col D. Stathakos, was intercepted and shot down between Nivitsa and Slatinia on 11 March 1941 with the loss of both crew members. Remnants of the three squadrons, stationed at Menidi, could not hold off the German invasion on 6 April 1941. Moving south to Tanagra they were all destroyed by constant German air attacks.

INDIA

Battle K7627 and target-tugs L5661, L5663 and L5726 were sent to the Anti-Aircraft School at Karachi in 1942.

IRELAND

The then Irish Army Air Corps approached the British Government for a number of aircraft to meet its needs during the Second World War. In 1941 it asked for 13 Hurricanes, 10 Harvards and three Battle target-tugs. The resulting offer, such as it was, amounted to 10 Hawker Hector biplanes, an offer the IAAC later accepted.



ABOVE: RCAF 1627 shows a Canadian turret modification to the Battle for gunnery training purposes. This created the MkII. VIA LARRY MILBERRY

However, a Battle arrived unexpectedly on 24 April 1941 when target-tug V1222 flown by a Polish pilot from No 4 Air Observer School at West Freugh force-landed at Corbally Strand, Tramore, County Waterford. The aircraft was not damaged and was later flown to Baldonnell where it was interned. In June 1944 it was decided to make use of V1222, and it was pushed into the Baldonnell workshops where a target-towing winch was fitted. Coded 92, the Battle carried out camera gun exercises with Hurricanes and joined No 1 Squadron in September 1940 for air-to-air firing duties. It was withdrawn and flown to a maintenance unit in May 1946.

NEW ZEALAND

Two Battles ended up in New Zealand, for some obscure reason. P6673 arrived in July 1941 after being used in Canada and became instructional airframe Inst 42. K9177 was despatched in November 1941, arrived in February 1942 and was numbered Inst 59.

POLAND

A Polish Military Mission to London was formed under Gen

Ludomił Rayski in June 1939. After prolonged negotiations with the British government and the Air Ministry it was agreed to supply one Spitfire, 10 Hurricanes and 100 Battles.

A batch of 30 was intended to be shipped to Danzig (Gdansk), but archives state that one Spitfire and 25 Battles were loaded. On 18 September 1939 a merchant ship left Liverpool escorted by the Polish destroyer ORP *Blyskawica*, the two arriving in Gibraltar four days later. However, Romania had declared that it was throwing in its lot in with the Germans and stopped the transit of all arms through its territory. The freighter turned quickly around and sailed through the Mediterranean, intending to put the aircraft ashore at Odessa, from where they would be transported over land to Poland.

With the German invasion of Poland the UK's Chief of the Air Staff offered the immediate release of 20 Battles, to be flown to France for collection by Polish pilots. The proposal was refused on the grounds that deliveries of war materiel would make no difference to the outcome. A decision was made to let the Turkish Air Force have the Battles that were on the ship.

SOUTH AFRICA

Under the Joint Air Training Scheme some 190 Battles were allocated to the South African Air Force, but 11 were lost at sea during delivery, 11 more were sent to Southern Rhodesia, four to India and four to Australia. The Battles were given serials 901 to 1082, 123 of these being kept as bombers with 51 target-tugs and five trainers.

During the East African campaign the SAAF used Battles in their intended role. On 19 May 1940 Maj R. Preller led No 11 Squadron, SAAF to Nairobi, Kenya — it had at its disposal 24 Hawker Hartbeests and one Battle. With Cpls Ackerman and Petterson making up his crew, Preller took a Battle on a reconnaissance over Mogadishu in Italian Somaliland on 17 June. Leaving the area he saw a Caproni Ca 133 on the ground near Afmadow and made a strafing run, only to be hit by a stray bullet in the radiator. The glycol gradually leaked away and the Merlin seized. Preller crash-landed safely and set fire to the Battle, the crew setting off on foot for base. For a week an aerial search looked for them with no success, but on 1 July the crew of a passing aircraft spotted Preller on a camel making his way home between Garissa and Liboi. He had left the two corporals at a water hole and pressed on himself. All were eventually rescued, Preller being awarded a DFC.

Squadron crews had gone back to South Africa in mid-June to collect 15 Battles, permitting them to strike at the enemy. This they did on many occasions, hitting Italian airfields, positions and vehicles. Some success was achieved, but in the face of quite severe losses. By June 1941, when No 11 Squadron was disbanded and its aircraft transferred to No 15 Squadron, only four Battles were left on strength — one of those was soon lost in an accident. The remainder carried on until 19 August, when the final example flew its last mission. The unit then withdrew back to Kenya to re-equip.

SOUTHERN RHODESIA

As part of the EATS, 25 Battles went to Southern Rhodesia. Formed at Moffat in August 1941 was No 24 Combined Air Observers School, re-designated in May 1943 as a Bombing, Gunnery and Navigation School. The Battle target-tug was its main equipment, with 25 on strength by 1944. In the unit's annual report it was stated, "Other than the extreme age of these machines, calling for constant repairs and replacements, very little trouble has been experienced on the type". The last 12 of Southern Rhodesia's Battles were struck off charge in August 1945.



Fairey Battle I target-tug RCAF 1639
Royal Canadian Air Force

CHRIS SANDHAM-BAILEY

TURKEY

An order for Battles was placed by the Turkish government before WW2. Four were in preparation at the Fairey factory — indeed, they had even been painted in Turkish Air Force markings — but with the situation in Europe the deal was cancelled before delivery. After protracted negotiations the British

Government agreed to deliver 30 Battles destined for Poland and divert them to Turkey. Where the extra five came from is unclear.

It was arranged that Fairey production test pilot Flt Lt Sam Moseley would test-fly the Battles as they were assembled, but when he arrived in Turkey the enthusiastic

Turks had already offloaded them from the ship, assembled the aircraft without any manuals, instructions or drawings and ferried them to Eskişehir with the undercarriages down and flaps locked up because the hydraulics were not working! Moseley's logbook confirms that 28 Battles were flight-tested with two

used for spares. A Battle target tug arrived in May 1940 but plans for three more fell through.

On 22 January 1943 a memo from the Turkish authorities declared that there were still 25 Battles on strength, even though Moseley had said the pilots had a penchant for very low, fast flying.

TESTBEDS

Although the Battle's characteristics in combat left a lot to be desired, the fairly docile machine with its modern engine bay and robustness made a good test aircraft. The long cockpit allowed the fitment of instrumentation and the carriage of a flight observer. With large numbers of Battles being turned out, the Air Ministry saw fit to release some to aero engine manufacturers for flight-testing.

On 1 October 1938 Battle K9331 arrived with Bristol to test the 1,065hp Taurus II engine for the Fairey Albacore, followed by the 1,130hp Taurus XII. The company received N2042 on 16 February 1939 to flight-test the Hercules II and later the Hercules XI, subsequently joined by N2184. Both were modified so that the undercarriage was permanently fixed down. These aircraft were used until April 1945.

Fairey was seeking a suitable testbed for its P24 engine and the Air Ministry released Battle K9370. The P24 was a 24-cylinder, H-layout unit, in effect built by bolting two Fairey Prince engines together. These drove synchronised co-axial counter-rotating propeller shafts with feathering propellers. Each half of the engine could be operated independently. So equipped, Chris Staniland took the aircraft on its first flight on 30 June 1939 and it went to the RAE on 12 July 1941.

Gen 'Hap' Arnold thought the unit would be suitable for fitting in US Army Air Corps machines, and K9370 was shipped to the USA on 5 December 1941. After undergoing extensive trials at Wright Field, Ohio, it was decided not to proceed with the

British engine and the Battle was returned to the RAE in 1943.

The air-cooled 24-cylinder Napier Dagger VIII was tested during 1938 on Battle K9240, and the liquid-cooled, 24-cylinder, 2,000hp Sabre by K9278 and L5287 from the following year. With Rolls-Royce, Battles trialled numerous Merlin derivatives, plus the Exe B (previously known as the Boreas) on K9222, and the Peregrine on N2110.

Not generally known is the use of Battles K9207 and K9208 on early airborne intercept (AI) radar trials. These aircraft arrived at Martlesham Heath on 3 June 1938 and were joined by K9230 on 30 June to form a special unit. First to be modified was K9208, with aerial antennae fixed on either side of the fuselage and radar display equipment in the rear cockpit. An RAF pilot flew the Battle, with a scientist from the airborne radar group at nearby Bawdsey operating the kit in the rear and another Battle acting as a simulated target.

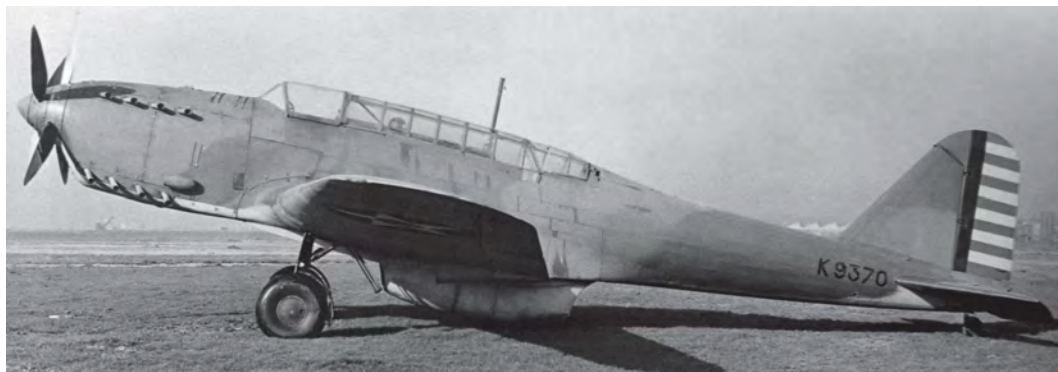
By 1 June 1939, K9208 had a system that could detect a hostile target at a maximum range of two miles and a minimum of 1,000 yards. This proved a major breakthrough and demonstrations to interested parties took place. These included Fighter Command's C-in-C ACM Sir Hugh Dowding, Winston Churchill, and Churchill's adviser (and member of the Committee for the Study of Aerial Defence) Prof Frederick Lindemann. Dowding and Lindemann got airborne to see the results for themselves. Each was sat on a plank arranged across the rear seat, which was shared with the radar operator, with all three trying to see the small cathode ray tube together!

So promising were the results that orders were given on 1 September 1939 to convert 30 Battles as AI-equipped night fighters. However, the authorities, realising the inadequacies of the Battle, had the order changed to 30 Blenheims.

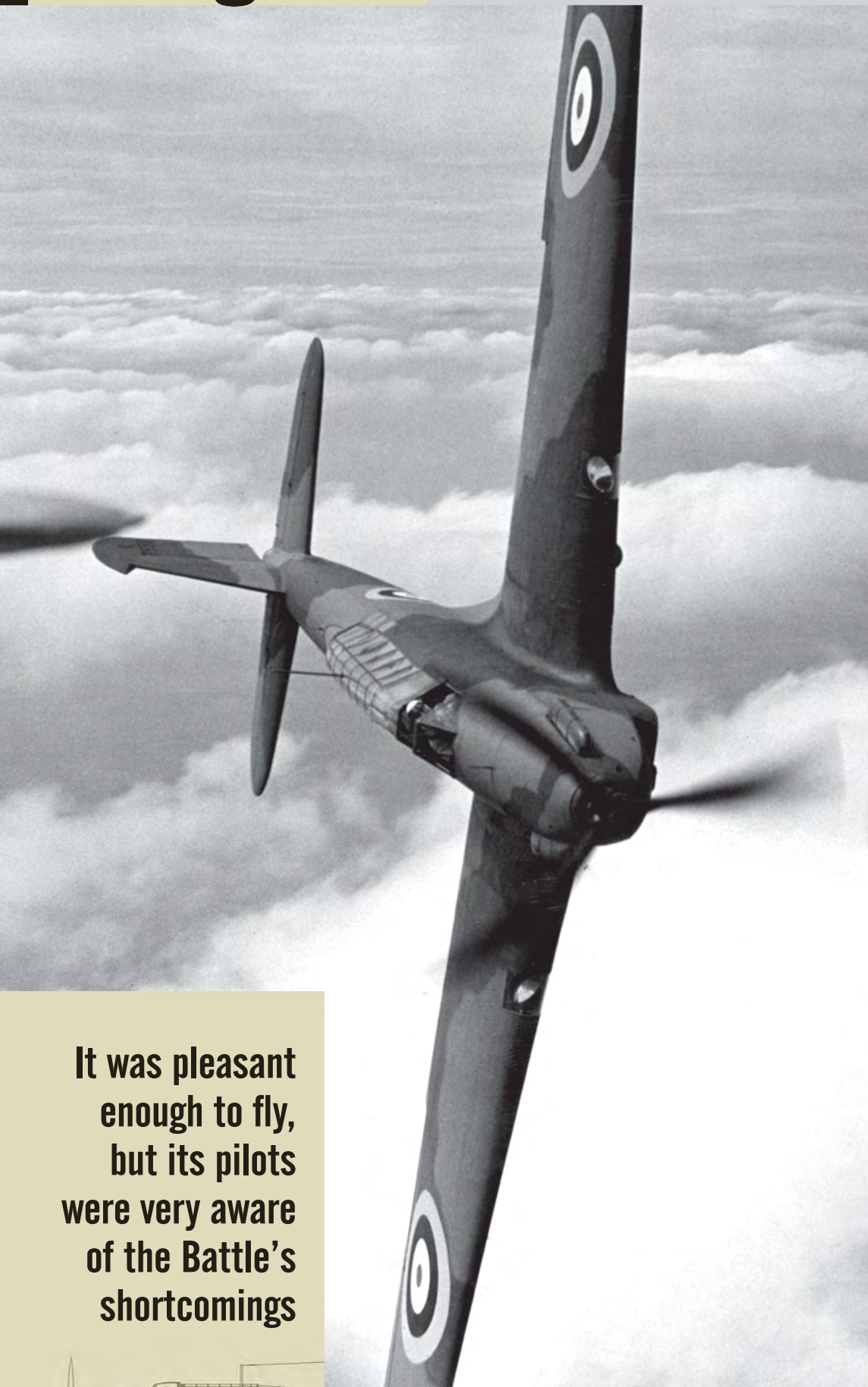
On the subject of night fighters, No 29 Squadron received Battle

target-tugs L5778, L5779, L5781 and L5796 in October 1940 to undertake trials towing flares to illuminate enemy aircraft and give night fighters a better chance of a successful attack. Three flares were carried, each burning for one minute, but the tests — which went on into 1941 — did not go well and the project was abandoned.

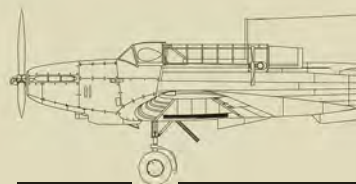
In September 1940 another project involving Battles took place under the codename 'Pandora' — the use of modified bombs as Long Aerial Mines. No 420 Flight was formed at Middle Wallop with the first Battle P5248 arriving that month, and L5049 and R7472 joining it in November 1940. The idea was to have mines suspended from each aircraft on a 2,000ft (609.6m) cable or some other device, while the enemy aircraft conveniently flew into the screen of cables, detonating the converted bombs as they did so. Not surprisingly, the project was abandoned as being too hazardous.



ABOVE: Battle K9370 with the Fairey P24 engine during US Army Air Corps trials at Wright Field, Ohio.
NATIONAL ARCHIVES AND RECORDS ADMINISTRATION



It was pleasant enough to fly, but its pilots were very aware of the Battle's shortcomings



ABOVE: A spirited demonstration of the Battle's handling qualities by test pilot Staniland in Mkl K7558, the first example from the initial production batch. AEROPLANE

Members of Battle squadrons in France were doing their very best with what was available and paid scant, if any, attention, to the rights and wrongs of aircraft design and bomb development. In his book 'What were they like to fly?' the late Sqn Ldr D. H. Clarke opined: "Almost any bomber was better than the hideously ugly Fairey Battle which was neither good to fly, nor as nice to fly on ops. It lumbered and wallowed behind its spinner-less, variable-pitch airscrew, incapable of reaching its designed top speed."

Another pilot said, "It was one of those aircraft [that was] reasonably safe and pleasant to fly but until experience was obtained it was an aircraft that demanded respect. I always liked flying it and when I gained more experience on the type I tried almost everything except spinning. Despite a general ruling that the aircraft was not meant for aerobatics there were very few that I did not attempt in the Battle. Taxiing presented no problems but the Battle did have a large keel surface which could become a little difficult in strong crosswinds. The tail-wheel was free-castering and not lockable. The view forward was quite good, considerably better than the Hurricane and Spitfire."

The Battle was an extremely robust aircraft and has been described as "just too easy to fly". Ground handling was relatively easy, even in strong winds, when the brakes worked smoothly, although the air pressure often failed.

The pilot's cockpit was comfortable enough. It was roomy without being unduly noisy and had quite a good forward visibility, but the rear vision was poor. As Sqn Ldr Rupert Parkhouse told the RAF Historical Society in 1998, the forward view from the navigator's position was virtually non-existent and he would correct any headings as each new fix appeared to port or starboard. If they got lost they could always, as Parkhouse put it, "do a Bradshaw" along any of the 200 local stations in the area. Sometimes, when the aircraft intercom failed, the pilot and navigator would pass cryptic notes to each other on little metal trays attached to an endless belt revolving round small hand-wheels at each crew position.

The rear gunner was not much better off. He had a tilting hood to screen his back from the slipstream, but because of the draught curling in and slapping him full in the face it was useless. The single rear gun had a poor arc of fire, with the rudder and tailplane effectively blocking most of it. The bomb-aimer's position was a nightmare — the bomb aimer would

lie face-down looking through an oil-stained Perspex panel which, with the excessive heat and glycol/oil spray causing the bomb-aimer's goggles to oil up, made accuracy a sheer impossibility.

Take-off was exceptionally easy, with little or no swing at full throttle. The Battle would leave the ground when 60mph (96.37km/h) indicated air speed was reached after a run of approximately 280 yards (256.03m) with half-flap at 24 degrees. After take-off the elevator and rudder controls were smooth and effective, as were the ailerons, which gave a stable condition in all centre of gravity positions. Landing checks were simple: reduce speed to 120mph (192.74km/h), check brake pressure, lower undercarriage, bring airscrew pitch to fine and switch mixture to rich. For final landing, flaps were set fully down at 45 degrees, speed reduced to 90mph (144.65km/h) and then 60mph (96.37km/h) over the hedge, with a landing run of approximately 390 yards (356.62m). In all circumstances it was quite pleasant to fly with no vicious tendencies or control snatch.



A ABOVE: In a posed photo for *The Aeroplane's* photographer, a No 226 Squadron Battle crew discusses the upcoming training sortie. AEROPLANE

BATTLE SURVIVORS

In the RAF Museum at Hendon is Battle I L5343, an Austin-built aircraft handed over to the RAF on 13 September 1939. It served with Nos 266 and 98 Squadrons until a forced landing in Iceland exactly a year after delivery. The airframe being deemed impossible to salvage, the crew set it ablaze after removing useful equipment, destroying the cockpit and centre fuselage section. The wreckage was recovered by a team from RAF Leeming during 1972 and flown back to the UK in a Shorts Belfast for restoration. This incorporated the centre and rear fuselage of L5340 and wing sections originally from another Battle, obtained from Sir William Roberts' Strathallan Collection. Completed at St Athan in March 1990, L5343 was moved to Hendon for display. From 2006-10, it underwent further work at the Rochester-based Medway Aircraft Preservation Society and the RAFM's own Michael Beetham Conservation Centre at Cosford.

The Royal Museum of the Armed Forces and Military History in Brussels has Battle R3950, another 1939 product of the Austin factory. It went to the Royal Canadian Air Force as serial RCAF 1899

in April 1941 and remained there until being struck off charge during February 1945. Much later, in 1972, the part-restored airframe returned to Britain, passing through the hands of the Strathallan Collection, Charles Church (including a period on loan to IWM Duxford) and the Historic Aircraft Collection. An exchange deal for Spitfire XIV RN201 saw R3950 going to the Belgian museum, which had long sought a Battle, in May 1990. It has since been restored into Belgian markings by volunteer members of the Brussels Air Museum Restoration Society and bears the serial 'T70', though examination still reveals some missing parts.

Just one other complete, preserved Battle remains extant – R7384, a MkI(T) gunnery trainer, in the Canada Aviation and Space Museum in Rockcliffe, Ontario. However, the South Australian Aviation Museum in Port Adelaide is restoring N2188 – which force-landed in swamps off Port Davis in 1943 during service with No 2 Bombing and Gunnery School – as a long-term project, and the remains of several further airframes can be found elsewhere. **Ben Dunnell**



ABOVE: It is a shame for the RAF Museum's Battle L5343 to be so hemmed-in. BEN DUNNELL



ABOVE: Battle R3950 in the Brussels museum, with flat tyres and missing panels. BEN DUNNELL