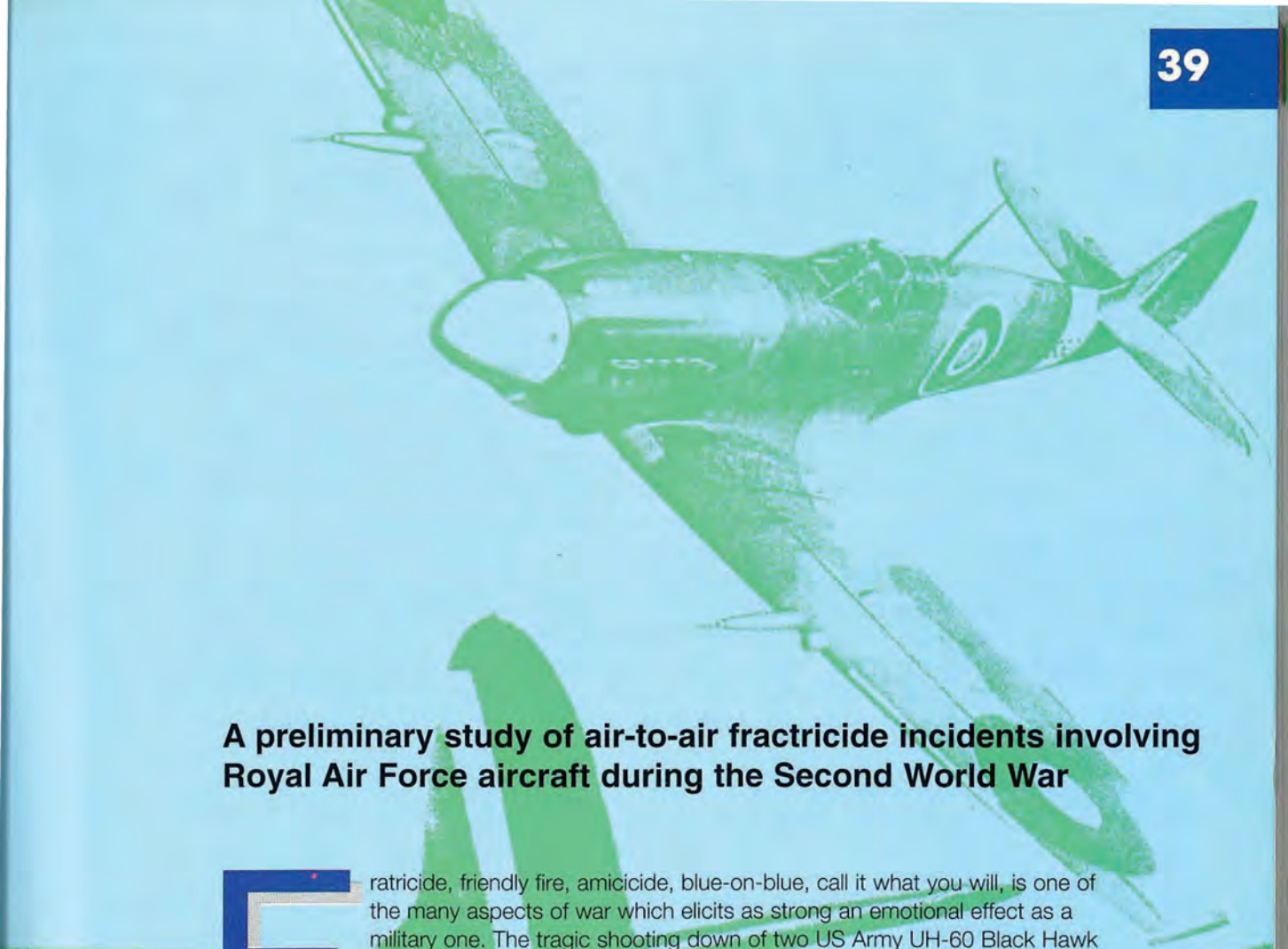
Air-to-Air BLUE ON blue

By Chris Hobson, Senior Librarian JSCSC, RAF Bracknell



A preliminary study of air-to-air fractricide incidents involving Royal Air Force aircraft during the Second World War

Fratricide, friendly fire, amicicide, blue-on-blue, call it what you will, is one of the many aspects of war which elicits as strong an emotional effect as a military one. The tragic shooting down of two US Army UH-60 Black Hawk helicopters over Northern Iraq on 14 April 1994 by two F-15 Eagles of the United States Air Force had a profound effect on the Coalition and NATO forces. Coming three years after the end of the Persian Gulf War that saw several instances of fratricide affecting ground forces, the Black Hawk incident rekindled the debate on airspace command and control and the need to reduce losses due to fratricide. A lengthy inquiry into the incident highlighted a number of concerns involving command and control procedures and human error resulting in censure for several of the personnel involved. Fratricide incidents like this tragedy are, mercifully, very rare. However, the fact that this could happen at all and especially in an environment which had the best technology available and special procedures designed to avert such an occurrence *and* that the fighting between the Coalition forces and Iraq had actually ceased some three years ago, only served to remind us of the difficulties in preventing this kind of incident.

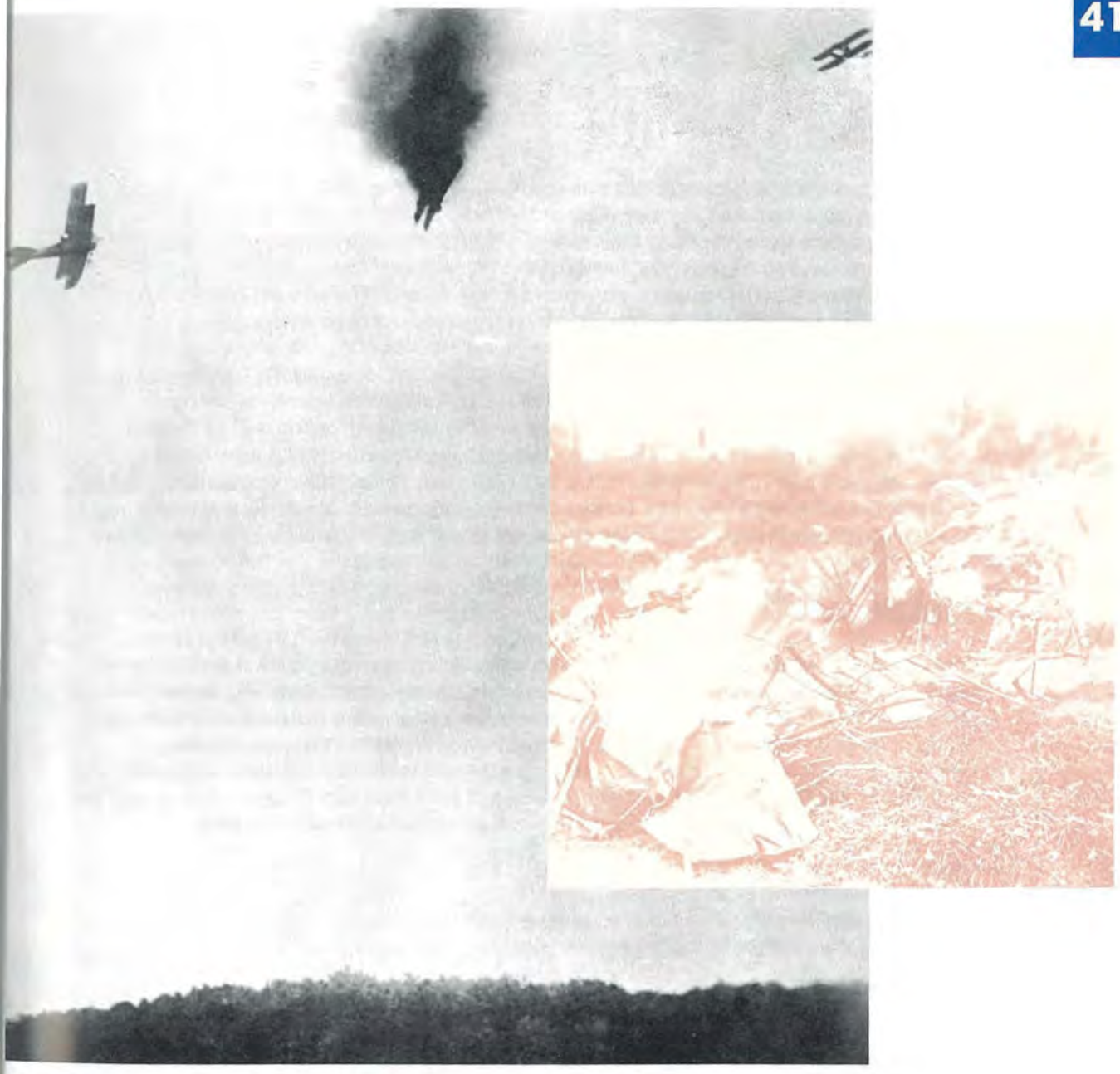
The issue of fratricide was hotly debated following the Persian Gulf War but until the Black Hawk incident the debate centred on the vulnerability of ground forces to friendly attack from both the air and the ground. Indeed, the air-to-air arena is usually overlooked by authors of books and papers on fratricide. Anyone reading the available literature on the subject could be forgiven for believing that air-to-air fratricide does not exist or is so rare as to be not worth worrying about. The events of 14 April 1994 would seem to indicate otherwise. There appears to be two main reasons for the scant attention given to air-to-air fratricide. Firstly, compared to other forms of fratricide, air-to-air incidents of a serious nature are infrequent. Secondly, air-to-air fratricide is often difficult to prove or investigate as there are usually fewer witnesses or survivors from such an incident. In addition the possibility exists that many air-to-air fratricide incidents have gone unrecorded because those involved did not realise at the time exactly what had happened. Incidents have occurred when

witnesses, including both attackers and victims, have accurately reported the events but in many cases it is possible that fratricide has occurred without either victim or attacker knowing it or, as least, willing to admit it. There is certainly evidence in combat reports of fighter pilots claiming to have shot down enemy aircraft only for it to be discovered that they had shot down a friendly aircraft. As air-to-air fratricide is so poorly covered in the published literature compared to that of other forms, the prospect of a systematic review of the problem is poor.

The difficulty in studying air-to-air fratricide is therefore one of finding hard evidence. Existing studies on fratricide are of little help in this respect. One of the earliest and still one of the best studies on fratricide was published in 1982 by the US Army Command and General Staff College. In this ground-breaking study, Lieutenant Colonel Charles Shrader concentrates on fratricide incidents that concern ground forces. He found (but does not list) a total of 269 surface-to-surface, air-to-surface, surface-to-air and, curiously, naval fratricide. Air-to-air incidents are not studied nor even mentioned. This pattern has been repeated in several books and articles published in the years since the issue was highlighted during the Persian Gulf War. With one exception, which is both anecdotal and partisan, these publications ignore air-to-air fratricide completely, probably for the reasons previously put forward. What follows in this paper is a preliminary effort to investigate the existing historical evidence for air-to-air fratricide and to attempt to draw some valid conclusions from the incident data.

Although published papers and books on air-to-air fratricide are rare, information on such incidents can be obtained from some of the many detailed histories of specific aircraft, units and events published in recent years. For the purposes of this paper the literature search has been confined to events involving the Royal Air Force during the Second World War simply because the published material on this Service is more easily available and more detailed than for any other. Although by no means exhaustive, the search has also included investigation of casualty information held by the Air Historical Branch. Although preliminary, this investigation does at least give an indication of the type and frequency of incident and the cause and effect.

It was originally intended that this study should include fratricide incidents which took place during the First World War as well as the Second World War. However, after consulting several reference works it became obvious that there were very few confirmed fratricidal losses involving British aircraft during the First World War, so few that their inclusion would have served no good purpose in this particular study. It is, however, worth investigating the possible reasons for this disparity. Air fighting in the 1914-1918 war was done at much closer quarters than in the Second World War. First World War fighter pilots were trained to close to within a few hundred feet of their target before opening fire and the closing speed even during a head-on attack would rarely exceed 250mph. Visual identification of an aircraft through its shape or colour scheme and markings was much easier than during the Second World War when firing distances were often measured in hundreds of yards and closing speeds could exceed 800mph. It is recorded in several First World War histories and biographies that pilots misidentified aircraft from long range only to identify their targets correctly when close enough to fire. This usually resulted in the attack not being carried through, but rarely was the incident reported at the time. However, more research is required for the First World War to find other examples and draw proper conclusions from firm evidence.



British fighter crashes in flames, shot down by German adversaries

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There are many definitions of fratricide to be found in the published literature but most differ little in substance one from another. At its most simple, and for the purposes of this paper only, fratricide is defined as an attack made on an aircraft by another friendly aircraft under the mistaken assumption that the target is an enemy. Confining the search to Royal Air Force aircraft destroyed or so badly damaged that they were written off due to fratricidal action by RAF or Allied aircraft, the table presented in this article reveals a total of 120 aircraft destroyed in 112 incidents during six years of war. Eighty-three (74%) of these incidents occurred during the day and 29 (26%) at night. A total of 135 airmen died in these incidents. The raw data can be interpreted in a number of ways, by aircraft type or role or by campaign or event.

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EARLY DAYS

It appears that there is a high risk of fratricide occurring during the early stages of a conflict when expectations are heightened and nerves are frayed. Indeed, the Second World War started badly for RAF Fighter Command with its very first casualties of war being victims of fratricide. The so-called "Battle of Barking Creek" is one of the few air-to-air fratricide incidents that has received widespread coverage in the published literature. The precise details of this incident are still rather confused but it appears that on 6 September 1939, just three days after the declaration of war, the Luftwaffe made its first appearance over Britain when six Heinkel He IIIs flew an armed

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reconnaissance up the Thames Estuary. The flight was reported as "unidentified aircraft" and an erroneous radar plot put them close to the boundary between 11 Group and 12 Group of RAF Fighter Command. It seems that the German aircraft turned back just as both Groups were despatching their fighters. However, unknown to the 11 Group controller one enthusiastic squadron had sent up twice as many aircraft than had been requested. It has been suggested that a Chain Home radar site reported a formation of Hurricanes as the unidentified formation due to a filter on the radar not working correctly. In the confusion that followed the RAF fighters were fired upon by anti-aircraft batteries, a not uncommon occurrence throughout the war. Two Spitfire pilots spotted the aircraft under anti-aircraft fire and assumed them to be enemy. Failing to identify the "enemy" aircraft as Hurricanes, the Spitfire pilots attacked and shot down two of the aircraft. The remaining 42 Spitfires and Hurricanes, still being fired on by anti-aircraft guns, were shaping up for a dogfight when the commanding officer of No 151 Squadron realised what was happening and took control thereby averting an ever greater tragedy. The state of utter confusion was made complete when a wave of fighters from 12 Group almost ran into each other on take off while the 11 Group Spitfires received a further pasting from the coastal batteries on the Essex coast. The fiasco has many of the elements which combine to make fratricide possible: the right psychological conditions (heightened expectation and misdirected enthusiasm); poor command and control (untried rules of engagement compounded by the incident taking place near a command boundary); poor visibility and identification skills (early morning low-angle sun combined with inadequate recognition training); and technical deficiencies (inoperative filters and radar presentation which was easy to misread). It should be noted that these root causes can still create conditions conducive to fratricide today despite advancements in technology and procedures.

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The Battle of France and the Battle of Britain in the spring and summer of 1940 resulted in a relatively large number of fratricidal incidents representing 16% of the war's total. The Battle of France was the first major occasion the RAF had been involved in air fighting since 1918 and the experience level of many aircrew was very low. It was perhaps inevitable that mistakes would be made in the heat of combat, especially as the RAF fighter units based in France and Southern England were under extreme pressure right from the start of the German offensive. This pressure continued and grew in intensity during the Battle of Britain when RAF Fighter Command pilots were being told that only they stood between ultimate victory and a German invasion and ultimate defeat. The psychological pressure on pilots to defend their homeland was immense and may well have been a root cause for many of the fratricide incidents in 1940. There is an interesting parallel here between RAF fighter pilots in the Battle of Britain and Luftwaffe fighter pilots who defended Germany in the latter years of the war when the tide of the air war over Germany had turned very much in the Allies' favour. Did the pressure which German pilots must have felt also cause incidents of fratricide in the Luftwaffe?

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EASILY CONFUSED?

It is readily apparent from the incident table that certain aircraft types appear to have been more vulnerable than others. The Bristol Blenheim was particularly unlucky suffering at least 15 confirmed losses to Allied fighters during the war, including four aircraft in the space of one week during the Battle of France. Several accounts suggest that the Blenheim was mistaken for the Junkers Ju88 which is highly likely as the two aircraft are of similar configuration and size and both types served in large numbers in most theatres throughout Northwest Europe. Perhaps less understandable is the confusion between the Blenheim and the Savoia-Marchetti SM79, a distinctive tthree-engined Italian bomber that operated in the Sudan where two Blenheims were shot down in separate fratricide incidents.

Another aircraft type which appears to have suffered from fratricidal attacks to a much higher than normal proportion was the Bristol Beaufighter with 17 losses. Most Beaufighters lost in these incidents were shot down at night, several by other Beaufighter night fighters. However, these losses might have more to do with the mode of operation than the appearance of the Beaufighter itself. The Beaufighter, like the Blenheim, bore a general similarity to the Junkers Ju88, while the de Havilland Mosquito, also much used as a night fighter, bore a superficial likeness to the Messerschmitt Me410. However, judging by first hand accounts of the night fighter war the risk of fratricide was usually more complex than a simple case of misidentification. Although equipped with

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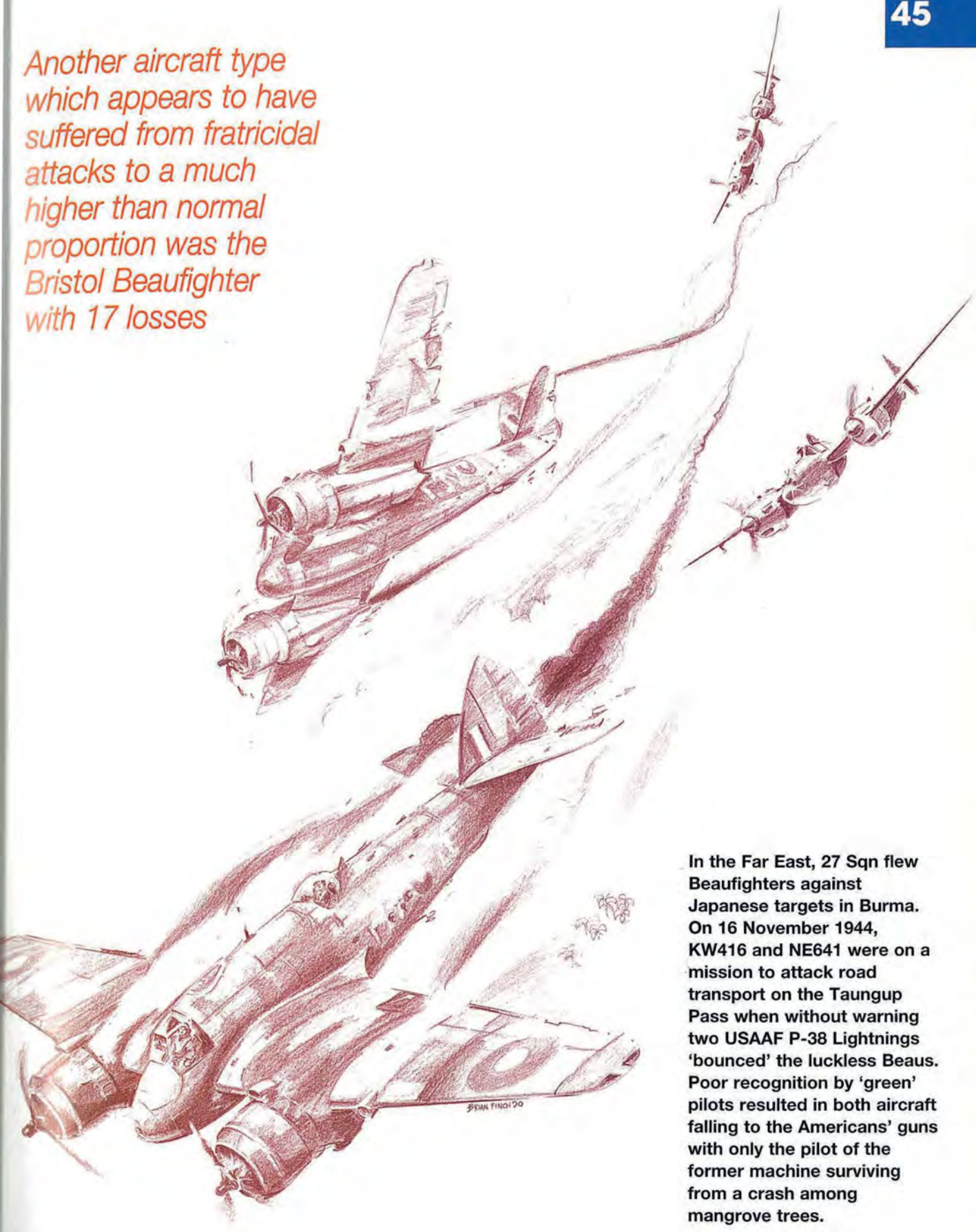

In the Far East, 27 Sqn flew Beaufighters against Japanese targets in Burma. On 16 November 1944, KW416 and NE641 were on a mission to attack road transport on the Taungup Pass when without warning two USAAF P-38 Lightnings 'bounced' the luckless Beaus. Poor recognition by 'green' pilots resulted in both aircraft falling to the Americans' guns with only the pilot of the former machine surviving from a crash among mangrove trees.

airborne interception radar, Identification Friend or Foe (IFF) equipment and under guidance from ground radar stations, night fighter operations were still plagued by a multitude of difficulties and night fighter actions account for 23% of the total number of incidents.

The introduction of the Hawker Typhoon in the summer of 1941 was plagued with problems from the start. Poor engine performance and reliability and structural problems in the fuselage/tail joint caused a number of early losses. However, fratricide was another significant cause of Typhoon attrition with a total of at least 12 aircraft being shot down in three years of service. Most of the reports of these incidents suggest that the Typhoon was being confused with the Focke-Wulf FW190 that was introduced into Luftwaffe service at about the same time. The two aircraft are superficially similar in shape; the FW190 has a radial engine in a circular cowling and, although the Typhoon has an in-line engine, the large circular air intake under the propeller spinner gave it the appearance of a radial engine from a distance. Also, in plan, the two aircraft have the same general proportions (although the Typhoon is a little larger than the FW190) with a distinctively short nose forward of the wing leading edge.

Cases of mistaken identity involving the Spitfire are a little more difficult to explain away. The Spitfire's elliptical wing makes the aircraft distinctive and unique although for the optimum identification effect it needs to be seen in plan rather than at oblique angles. The fact that a significant number of Spitfires figure in the incident table (22 aircraft, 18%) may only indicate the very large number of Spitfires in service and the type's heavy involvement in air combat throughout the war. Even less understandable is the loss of four Westland Lysanders in fratricide incidents. This aircraft was surely one of the most distinctive Allied aircraft produced during the war with its high-mounted complex-tapered wing, huge tailfin, deep fuselage, large-diameter radial engine and out-of-proportion fixed undercarriage. The German Henschel Hs 126 was vaguely similar in general arrangement but should have been easy to distinguish from the Lysander by attention to detail especially as neither type was known for its speed and attacking aircraft should have had time to make a positive identification.

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One of the most surprising conclusions that may be drawn from the incident table is that very few RAF night bombers, especially the 4-engine heavy bombers, were claimed by fratricide. There may be a number of explanations for this apparent good fortune. Firstly, in the early years of the war the RAF's night fighter force was small and poorly equipped and its successes were fairly rare. However, this argument also works against the explanation because the rudimentary nature of the RAF's early night fighter operations probably put the night bombers more at risk than later in the war when more effective radar and IFF equipment was available (although even by the end of the war the IFF sets in use were still regarded as far from perfect). It is possible that the night operation system worked out between RAF Bomber Command and Fighter Command was the reason for the low attrition rate of night bombers to fratricide. However, night fighter operations during the war relied heavily on visual identification as the final element of a successful attack and this may explain

the lack of 4-engined heavy bomber losses to Allied night fighters. Apart from the Focke-Wulf FW200 Condor, which was primarily a long range maritime patrol aircraft, and a few transport aircraft and flying boats, the Luftwaffe possessed no 4-engined aircraft. If a night fighter could see four engines as opposed to two, then the target was almost certainly friendly. This explanation may be the best single reason for the apparent low incidence of losses of RAF night bombers.

However, it is also possible that the number of bomber fratricide incidents discovered so far is unrepresentative. Tracing the exact cause for the loss of night bombers during the Second World War is one of the most difficult areas of aircraft attrition investigation. The very nature of night bomber operations meant that the aircraft were operating very much alone even if part of a massive raid. The aircraft were usually out of radio contact and when aircraft were shot down there were often no survivors to tell what happened, even if they knew. This is reflected in the huge proportion of RAF night bombers posted as "missing" with very little knowledge of the exact circumstances of their loss or even the whereabouts of their wreckage. It is possible therefore that, knowing of a few incidents of fratricide amongst the RAF's night bombers, there were more, perhaps even many more, which we do not know about and may never be able to determine. This is not to suggest that large numbers of RAF night bombers were shot down by Allied night fighters over enemy territory or, more likely, by other RAF bombers on the same raid. The loss of the Stirling on 13 August 1943 is a good illustration of the dangers involved in night bombing. The aircraft was

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fired upon by the rear gunner of another Stirling which suddenly loomed out of the dark in front of it. One crewmember was killed and the pilot mortally wounded. Had it not been for the pilot's immense courage and willpower that enabled the aircraft to reach an Allied airfield in Algeria, the story of the incident might never have been known. The posthumous award of the Victoria Cross to Flight Sergeant A L Aaron is the sole occasion when an airman had been awarded the country's highest gallantry award as a result of a fratricide incident. With incidents like this in mind, the possibility remains that more night bombers were lost to fratricide than the incident table suggests simply because incomplete information on the circumstances of night bomber attrition makes an accurate determination and analysis less likely than for any other type of air operation.

COALITIONS, COLOUR SCHEMES AND OUT OF AREA

The comments noted earlier regarding the low experience level of RAF aircrew together with increased anticipation and pressures to perform well could equally apply to United States Army Air Force fighter pilots later in the war. From late 1947 the number of fratricide incidents involving USAAF fighters rose to a significant proportion. Throughout 1944 18 of the 28 RAF aircraft lost to fratricide were attributed to USAAF action and even included the loss of a Beaufighter to a B-24 Liberator over Suffolk. The rapid introduction of large numbers of American fighter squadrons into the densely packed skies of Eastern England caused many airspace control problems so it is not surprising that fratricide incidents also resulted. Complaints by RAF aircrew and senior officers about the standard of the USAAF's aircraft identification (whilst probably justified in many cases) appear to forget the mayhem that the RAF had been inflicting upon itself throughout the war. In the last five months of the war the USAAF accounted for 58% of fratricide incidents (7 out of 12 aircraft) involving the loss of RAF aircraft. However, it should be remembered that by June 1944 the USAAF had 99 fighter squadrons based in Northwest Europe compared to 100 RAF fighter squadrons. Allowing for the Americans' relative inexperience the high proportion is not, therefore, difficult to explain.

The value of aircraft colour schemes and markings in reducing fratricide is a question which needs further investigation. The RAF, along with other air forces, has spent considerable time, money and effort in devising colour schemes and markings which suit a particular purpose, usually either for concealment or conspicuity. However, from some distance and in certain light conditions many camouflage schemes are difficult to distinguish one from another and serve little purpose for identification. The problem of air-to-air and ground-to-air fratricide obviously worried air planners in 1944. Just prior to the invasion of Normandy most RAF and USAAF tactical aircraft were painted with prominent black and white stripes around their wings and fuselage. However, this aid to identification did not save the 11 RAF fighters shot down between June and September 1944, most or all of which would have been wearing "D-Day stripes". In January 1945 the markings of RAF aircraft operating in Europe with the 2nd Tactical Air Force were changed in an effort to reduce the number of mistaken attacks by friendly fighters. However, the changes were relatively minor and appeared to have little effect as 11 more aircraft were lost to fratricide between January and April.

Outside of Northwest Europe fratricidal incidents appear to be less common with only 21 reported in the Middle East, Mediterranean and North Africa and only two reported in the Far East. However, the rate of air operations in theatres outside Northwest Europe was lower (although not perhaps in the same proportion as the incidents of fratricide would suggest) and conditions were often very different. Additionally, the amount of detailed information for RAF air operations in the Middle and

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Far East is scant compared to that for air operations over Britain, Germany and occupied Europe. In the Far East many squadrons lost their records during the withdrawal from Malaya and this and other problems with compiling records, may have resulted in some incidents of fratricide being "lost". Even so it does appear that, for whatever reasons, there genuinely was a lower frequency of fratricide in the Middle East and Far East theatres.

CAUSES AND CONSEQUENCES

The immediate cause of the loss of the aircraft and crews listed in the incident table is the visual misidentification of friendly aircraft for those of the enemy. However, the root cause in most cases is more complex and, like many aircraft accidents, is often the result of a chain of events which create the potential for visual misidentification to take place. Command and control procedures, and in particular rules of engagement, play a major part in the chain of events. The potential for fratricide increases when more than one command authority is involved. In the early part of the Second World War, when radar direction was in its infancy, there were many instances of fighters being vectored onto friendly formations. Indeed this was a major factor in the very first fratricide incident of

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the war, the so-called "Battle of Barking Creek" as well as the shooting down of two Hampdens in December 1939. Once vectored onto a target it is difficult to break the "mind set" which many aircrew adopt with the result that pilots see what they expect to see, that is, the enemy, rather than what is actually there. Changes in procedure that are not widely advertised or non-adherence to procedure have been known to cause similar problems. Several aircraft listed in the incident table became fratricide victims when their attempt to return to base coincided with an enemy air raid. Defenders in these circumstances fully expect to see enemy aircraft and have been known to attack friendly aircraft despite warnings from ground stations or wingmen.

A condition that is particularly conducive to fratricide is when two different sets of rules of engagement are in force or where command and control boundaries meet. As in the Persian Gulf War, a significant number of fratricide incidents listed in the table involve what we might now call "coalition partners". In the case of the Second World War these partners were the United States Army Air Force (responsible for 30 incidents), the South African Air Force (2), the Royal Norwegian Air Force (1) and Soviet Air Force (1).

For long the accepted casualty rate for fratricide in 20th century warfare has been around 2%. However several studies in recent years now suggest that, for ground forces at least, the actual figure may be between 10 and 25%, a staggering difference. If this is true, fratricide on the ground must have had a devastating effect on all modern wars. Using the incident table against attrition statistics for selected campaigns it is obvious that the rate of air-to-air fratricide was significantly lower than even the lowest estimate. For example during the Battle of France the RAF squadrons based both in France and in Britain lost a total of 1,029 aircraft to all causes yet only six aircraft,

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representing 0.6% of the total, were confirmed fratricide victims. Even during the Battle of Britain when the RAF lost a total of 1,023 fighters, only 10 (just under 1%) were lost to fratricide. As noted earlier there is good reason to suspect that some cases of fratricide amongst the RAF's night bombers were unrecorded. However, of the known cases the sum total of 13 Battles, Halifaxes, Hampdens, Manchesters, Stirlings, Wellingtons and Whitleys confirmed as lost to fratricide represent a mere 0.1% of the 11,079 aircraft of all types lost by Bomber Command on operations between 1939 and 1945. Possibly a worst case example is provided by the Typhoon which was frequently mistaken for the FW190, but from at least 780 aircraft listed as being confirmed shot down or missing on operations only 12 (1.5%) were lost as the result of fratricide.

Whilst bearing in mind that the incident table is a first attempt at compiling a comprehensive list of RAF fratricide victims and is undoubtedly incomplete, it is obvious that, regrettable as these losses are, the destruction of 120 aircraft represents only a tiny fraction of the Allied aircraft losses during the war. It is also apparent that the frequency of air-to-air fratricide was significantly lower than that of incidents involving ground forces. Does this mean that we can afford to ignore air-to-air fratricide? Again, the events of 14 April 1994 appear to suggest not. For while the historic casualty rate may be low, the significance of air-to-air fratricide should not be underestimated. The loss of a prime target, for example a Sentry AWACS or a J-STARS aircraft, to fratricide could spell disaster

for coalition forces during an air campaign and would also have a huge impact on the public perception of air power. Quite apart from the tragic loss of human life, these factors alone should be a spur to continued efforts to reduce the opportunities for fratricide to occur. The replacement of manned aircraft with Unmanned Aerial Vehicles will not eliminate fratricide (although it will reduce human casualties); in fact the loss of the reasoning and judgement provided by a human pilot may actually increase the potential for such incidents. Indeed there is no single answer to the problem of fratricide. Certainly technology can help to a large extent; the development of more sophisticated IFF and C3 systems will assist but these must be accompanied by robust rules of engagement, improved command and control procedures, better co-ordination between allies and national Services, realistic combat training and proficiency in visual identification. Air-to-air fratricide, like other forms, will never be completely eradicated but that does not mean that every effort should not be made to make it as unlikely as possible.

Table of fratricide incidents involving the loss of RAF aircraft 1939-1945

(1) 6 Sep 1939 2 x Hurricanes 56 Sqn (day) 1 killed
Shot down by Spitfires near Ipswich after an erroneous radar vector

(2) 27 Oct 1939 Anson 608 Sqn (day) 3 killed
Shot down by a Hurricane off the mouth of the River Humber during a coastal reconnaissance

(3) 21 Dec 1939 2 x Hampdens 44 Sqn (day) 1 killed
Shot down by Spitfires over the North Sea as a bomber formation was returning from a search for the Deutschland off Norway

(4) 3 Mar 1940 Hudson PDU (day) 2 killed
Shot down by Hurricanes over Gravesend while photographing RAF airfields

(5) 15 May 1940 Blenheim 53 Sqn (day) 3 killed
Shot down by a Hurricane while on a reconnaissance sortie near Tournai, another Blenheim was damaged the same day

(6) 16 May 1940 Blenheim 53 Sqn (day) 0 killed
Damaged by a Hurricane and crash landed at Amiens, France

(7) 21 May 1940 Blenheim 18 Sqn (day) 0 killed
Damaged by Spitfires and crash landed near Boulogne during a raid on enemy troop columns

(8) 21 May 1940 Blenheim 18 Sqn (day) 3 killed
Shot down by a Hurricane over northern France

(9) 27 May 1940 Lysander 16 Sqn 9 (day) 0 killed
Damaged by a Hurricane during a supply drop at Calais and written off in forced landing at Hawkinge

(10) 31 May 1940 Lysander 16 Sqn (day) 2 killed
Shot down by Spitfires near Dunkirk, France

(11) 7 Jul 1940 Hurricane 79 Sqn (day) 1 killed
Shot down by Spitfires over Kent

(12) 8 Jul 1940 Hurricane 79 Sqn (day) 1 killed
Shot down by RAF fighters

(13) 31 Jul 1940 Battle 12 Sqn (night) 3 killed
Shot down by an RAF night fighter off the Lincolnshire coast when setting out on a raid on the channel ports

(14) 11 Aug 1940 Hurricane 56 Sqn (day) 1 killed
Probably shot down by a Spitfire while on convoy patrol

(15) 15 Aug 1940 Blenheim 604 Sqn (day) 0 killed
Damaged by a Spitfire and written off in a forced landing at Middle Wallop

(16) 24 Aug 1940 Blenheim 235 Sqn (day) 2 killed
Shot down by an RCAF Hurricane over the English Channel, 2 other Blenheims were damaged during the attack

(17) 28 Aug 1940 Spitfire 54 Sqn (day) 0 killed
Shot down by a Spitfire over Kent during a dogfight with enemy fighters

(18) 28 Aug 1940 Hurricane 56 Sqn (day) 0 killed
Probably shot down by a Spitfire over the Thames

(19) 31 Aug 1940 Spitfire 54 Sqn (day) 0 killed
Probably shot down by Hurricanes over Kent during a dogfight with enemy fighters

(20) 3 Sep 1940 2 x Blenheims 25 Sqn (day) 1 killed
Shot down by Hurricanes over North Weald airfield, 1 other Blenheim was damaged in the attack

(21) 2 Oct 1940 Blenheim 254 Sqn (day) 0 killed
Damaged by a Hurricane while on convoy escort over the North Sea and crash landed at Montrose

(22) 13 Oct 1940 Blenheim 29 Sqn (day) 3 killed
Shot down by Hurricanes of a Czech RAF squadron near the Wirral, another Blenheim was damaged in the attack

(23) 26 Oct 1940 Blenheim 14 Sqn (day) 0 killed
Shot down by Gladiators in the Sudan, mistaken for an Italian Air Force Savoia Marchetti SM79

(24) 13 Nov 1940 Beaufighter 219 Sqn (night) 2 killed
Shot down over Kent possibly by another RAF night fighter

(25) 4 Feb 1941 Blenheim 14 Sqn (day) 0 killed
Shot down by SAAF Hurricanes in the Sudan

(26) 10 Mar 1941 Halifax 35 Sqn (night) 4 killed
Shot down by an RAF night fighter over Surrey when returning from a raid on Le Havre

(27) 3 Apr 1941 Whitley 51 Sqn (night) 1 killed
Shot down by a Hurricane night fighter over Dorset when setting out on a raid on shipping at Brest

(28) 14 Apr 1941 Maryland 69 Sqn (night) 0 killed
Damaged by a Hurricane and crash landed at Luqa, Malta

(29) 3 May 1941 Beaufighter 252 Sqn (day) 0 killed
Damaged by a Hurricane and crash landed at Luqa, Malta

(30) 9 May 1941 Beaufighter 252 Sqn (day) 0 killed
Shot down near Warwick by a Beaufighter night fighter from another squadron

(31) 17 Jun 1941 Beaufort 3 OTU (day) 3 killed
Shot down by a Hurricane over Devon

(32) 21 Jun 1941 Manchester 207 Sqn (night) 7 killed
Shot down by a Beaufighter night fighter near Northampton when returning from a raid on Boulogne. Another Manchester was badly damaged by a Defiant night fighter on the same raid

(33) 1 Jul 1941 Wellington 311 Sqn (night) 6 killed
Shot down over Wiltshire by an RAF night fighter when returning from a raid on Cherbourg

(34) 1 Aug 1941 Hurricane 242 Sqn (day) 1 killed
Shot down by a Spitfire during an offensive sweep

(35) 15 Nov 1941 Blenheim 54 OTU (day) 1 killed
Shot down by Spitfires over Yorkshire

(36) 20 Dec 1941 Tomahawk 250 Sqn (day) 0 killed
Attacked by other Tomahawks and crash landed near Gazala, Egypt

(37) 30 Mar 1942 Blenheim 14 Sqn (day) 3 killed
Shot down by a SAAF Hurricane over Egypt

(38) 4 May 1942 Stirling 218 Sqn (night) 0 killed
Shot down over Sussex by a Turbinlite Havoc and Hurricane night fighting team when returning from a leaflet dropping mission over France

(39) 23 May 1942 Spitfire 402 Sqn (day) 0 killed
Shot down off Dover by a Spitfire which was then itself attacked by the victim's wingman

(40) 27 May 1942 Blenheim 1401 Flt (day) 3 killed
Shot down by a Whirlwind which later ditched

(41) 29 May 1942 Beaufighter 236 Sqn (day) 0 killed
Damaged by Spitfires and crash landed at Lowestoft

(42) 1 Jun 1942 2 x Typhoons 56 Sqn (day) 1 killed
Shot down by Spitfires over the English Channel

(43) 14 Jun 1942 Beaufighter 604 Sqn (night) 0 killed
Shot down by another Beaufighter night fighter over Hampshire

(44) 1 Jul 1942 Spitfire 72 Sqn (day) 1 killed
Shot down by Spitfires off Beachy Head – Station Commander of Biggin Hill killed

(45) 23 Jul 1942 Beaufighter 25 Sqn (night) 1 killed
Shot down by Spitfires over the English Channel

(46) 30 Jul 1942 Spitfire 72 Sqn (day) 1 killed
Shot down by Spitfires over the English Channel

(47) 8 Aug 1942 Beaufighter 409 Sqn (night) 2 killed
Shot down by a Mosquito night fighter over the North Sea

(48) 14 Aug 1942 Kittyhawk 260 Sqn (day) 0 killed
Probably shot down by another Kittyhawk in the Western Desert

(49) 19 Aug 1942 Typhoon 266 Sqn (day) 1 killed
Shot down by Spitfires from a Norwegian RAF squadron when returning from the Dieppe Raid

(50) 4 Sep 1942 Hampden 144 Sqn (day) 1 killed
Shot down by a Soviet Air Force Hurricane near Murmansk as two RAF squadrons deployed to Vaenga

(51) 28 Oct 1942 Whitley 58 Sqn (day) 0 killed
Damaged by a Royal Norwegian Air Force Northrop N3-PB and crash landed at Hovn, Iceland

(52) 8 Nov 1942 Hudson 233 Sqn (day) 4 killed
Missing off Casablanca and presumed shot down by US Navy F4F Wildcats

(53) 16 Dec 1942 Marauder 14 Sqn (day) 1 killed
Shot down by a Spitfire off Benghazi, Libya when it was returning from a minelaying sortie to Tunis. The Spitfire was damaged by return fire and force landed in Malta

(54) 17 Dec 1942 Spitfire 91 Sqn (day) 1 killed
Shot down by Typhoons in the Straits of Dover

(55) 23 Dec 1942 Beaufighter TFU (day) 2 killed
Shot down by Spitfires off the Norfolk coast

(56) 27 Dec 1942 Hudson 117 Sqn (day) 5 killed
Shot down by USAAF fighters near Thelepte, Tunisia

(57) 13 Jan 1943 Beaufighter 153 Sqn (day) 0 killed
Shot down by USAAF P-40s near Tebessa, Algeria

(58) 20 Jan 1943 Mustang 400 Sqn (day) 1 killed
Shot down by a Typhoon near the Isle of Wight

(59) 18 Feb 1943 Beaufighter FIU (night) 1 killed
Shot down by a Wellington which the Beaufighter was stalking following a misdirected GCI vector

(60) 6 Mar 1943 Spitfire 601 Sqn (day) 0 killed
Attacked by a USAAF P-40 and crash landed at Ben Gardane, Tunisia

(61) 14 Apr 1943 Hudson 500 Sqn (night) 4 killed
Shot down by a Beaufighter off Algiers

(62) 17 Apr 1943 Typhoon 266 Sqn (day) 0 killed
Shot down by Spitfires near Exeter

(63) 5 Jun 1943 Beaufighter 29 Sqn (night) 0 killed
Shot down by a Mosquito night fighter over Suffolk

(64) 17 Jun 1943 Mustang 414 Sqn (day) 1 killed
17 Jun 1943 Spitfire 412 Sqn 1 killed
Patrols from two Canadian squadrons clashed off Land's End with the result that two aircraft were shot down

(65) 13 Jul 1943 Beaufighter 46 Sqn (day) 0 killed
Damaged by Spitfires over North Africa and written off

(66) 29 Jul 1943 Mosquito 544 Sqn (night) 2 killed
Shot down by another Mosquito over Oxfordshire when returning from a night reconnaissance sortie

(67) 13 Aug 1943 Stirling 218 Sqn (night) 2 killed
Damaged by gunfire from another Stirling and crash landed at Bone, Algeria after bombing Turin

(68) 14 Aug 1943 Hurricane 137 Sqn (night) 1 killed
Believed shot down over the English Channel by a Mosquito during a night anti-shipping patrol

(69) 16 Aug 1943 Wellington 21 OTU (night) 2 killed
Shot down in error over Hampshire

(70) 17 Aug 1943 Spitfire 43 Sqn (day) 0 killed
Shot down by a USAAF P-51 over Sicily

(71) 27 Aug 1943 Beaufighter Cal Flt (day) 2 killed
Shot down by USAAF Spitfires over Sicily

(72) 10 Dec 1943 Beaufighter 68 Sqn (night) 1 killed
Shot down by a Mosquito night fighter over Suffolk

(73) 21 Dec 1943 2 x Typhoons 609 Sqn (day) 2 killed
Shot down by USAAF P-47s near Doullens, France when escorting American B-26s

(74) 21 Dec 1943 Spitfire 501 Sqn (day) 0 killed
Shot down by a USAAF P-47 over France

(75) 8 Jan 1944 Spitfire 225 Sqn (day) 0 killed
Shot down by a USAAF P-51 near San Giorgio, Italy

(76) 28 Mar 1944 Mosquito 107 Sqn (day) 2 killed
Shot down by a USAAF P-51 near Dieppe, France

(77) 1 Apr 1944 Ventura 500 Sqn (night) 4 killed
Missing on convoy patrol and presumed shot down by a Beaufighter

(78) 7 Apr 1944 Spitfire 682 Sqn (day) 0 killed
Shot down by another Spitfire during a reconnaissance sortie over the Mediterranean

(79) 26 Apr 1944 Mitchell 320 Sqn (day) 0 killed
Shot down by a Mosquito over Kent

(80) 11 Jun 1944 Mosquito 333 Sqn (day) 1 killed
Damaged by Allied fighters and ditched off the Orkneys

(81) 23 Jun 1944 Halifax 76 Sqn (night) 7 killed
Thought to have been damaged by an Allied night fighter and crashed at Hotham, Yorks when returning from a raid on Laon, France

(82) 27 Jun 1944 Beaufighter 68 Sqn (day) 0 killed
Shot down by a USAAF B-24 over Suffolk

(83) 28 Jun 1944 Mosquito 192 Sqn (night) 0 killed
Damaged by another Mosquito over Northern France and crash landed at Friston

(84) 9 Jul 1944 Spitfire 341 Sqn (day) 0 killed
Shot down by a USAAF P-47 near Rouen, France

(85) 14 Jul 1944 Spitfire 132 Sqn (day) 1 killed
Shot down by a USAAF P-51 near Calvados, France

(86) 24 Jul 1944 Spitfire 453 Sqn (day) 1 killed
Shot down by USAAF P-51 near Bayeux, France

(87) 5 Aug 1944 Lysander 161 Sqn (night) 1 killed
Shot down by a Mosquito near Rennes while on SOE flight

(88) 10 Aug 1944 Mustang 122 Sqn (day) 0 killed
Shot down by a USAAF P-38 near St Leger, Normandy during an air test

(89) 15 Aug 1944 Spitfire 602 Sqn (day) 0 killed
Shot down by a USAAF P-51 near Bernay, France

(90) 17 Aug 1944 Spitfire 602 Sqn (day) 0 killed
Shot down by a USAAF P-51 near Falaise, France

(91) 26 Aug 1944 Spitfire 602 Sqn (day) 0 killed
Attacked by USAAF P-47s and ran out of fuel while taking evading action, crash landed near Manche, France

(92) 29 Sep 1944 Mosquito 21 Sqn (night) 2 killed
Shot down by another intruder over Germany

(93) 2 Oct 1944 Mosquito 140 Sqn (day) 2 killed
Shot down by a USAAF P-47 during a reconnaissance sortie near Louvain, Belgium

(94) 2 Nov 1944 Mosquito 219 Sqn (night) 0 killed
Damaged by fire from a Stirling bomber during a night patrol and crash landed near Melsbroek, Belgium

(95) 7 Nov 1944 Spitfire 43 Sqn (day) 0 killed
Shot down by a USAAF P-51 near Padua, Italy

(96) 11 Nov 1944 Spitfire 43 Sqn (day) 1 killed
Shot down by USAAF P-51s near Venice, Italy

(97) 16 Nov 1944 2 x Beaufighters 27 Sqn (day) 4 killed
Shot down by USAAF P-38s near Taungup Pass, Burma

(98) 21 Nov 1944 Mosquito 157 Sqn (day) 0 killed
Shot down by another Mosquito from the same squadron during a night patrol over Holland

(99) 22 Nov 1944 Lysander 148 Sqn (day) 4 killed
Shot down by USAAF P-51s near Venice, Italy

(100) 24 Dec 1944 Typhoon 439 Sqn (day) 1 killed
Shot down by USAAF P-47s near Duren, Germany

(101) 25 Dec 1944 Spitfire 416 Sqn (day) 1 killed
Shot down by a USAAF P-47 near Houffalize, Belgium

(102) 1 Jan 1945 Typhoon 183 Sqn (day) 1 killed
Shot down by a USAAF P-51 during the Luftwaffe's Operation Bodenplatz

(103) 14 Jan 1945 Typhoon 174 Sqn (day) 0 killed
Shot down by USAAF P-47s near Haltern, Germany

(104) 14 Jan 1945 Typhoon 247 Sqn (day) 1 killed
Shot down by USAAF P-47s near Ewijk, Holland

(105) 17 Jan 1945 Mustang 2 Sqn (day) 1 killed
Shot down by Spitfires near Nijmegen, Holland

(106) 17 Jan 1945 Mustang 268 Sqn (day) 1 killed
Shot down by Spitfires near Bocholt, Germany

(107) 14 Feb 1945 Harvard 42 Sqn (day) 0 killed
Damaged by a Spitfire while photographing the 14th Army's crossing of the Irrawaddy and crash landed near Meiktila, Burma

(108) 22 Feb 1945 Tempest 56 Sqn (day) 0 killed
Shot down by USAAF P-51s near Cloppenburg, Germany

(109) 2 Mar 1945 Typhoon 198 Sqn (day) 1 killed
Shot down by USAAF P-51s during a rocket attack on shipping on the Rhine near Neuss, Germany

(110) 7 Mar 1945 Mosquito 105 Sqn (night) 0 killed
Shot down by an Allied night fighter near Frayling Abbey, Norfolk on return from a raid on Berlin

(111) 31 Mar 1945 2 x Spitfires 416 Sqn (day) 0 killed
Shot down by USAAF P-51s near Rheine, Germany

(112) 24 Apr 1945 Mosquito 409 Sqn (night) 0 killed
Damaged by another Mosquito while on patrol and crash landed near Lille, France

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