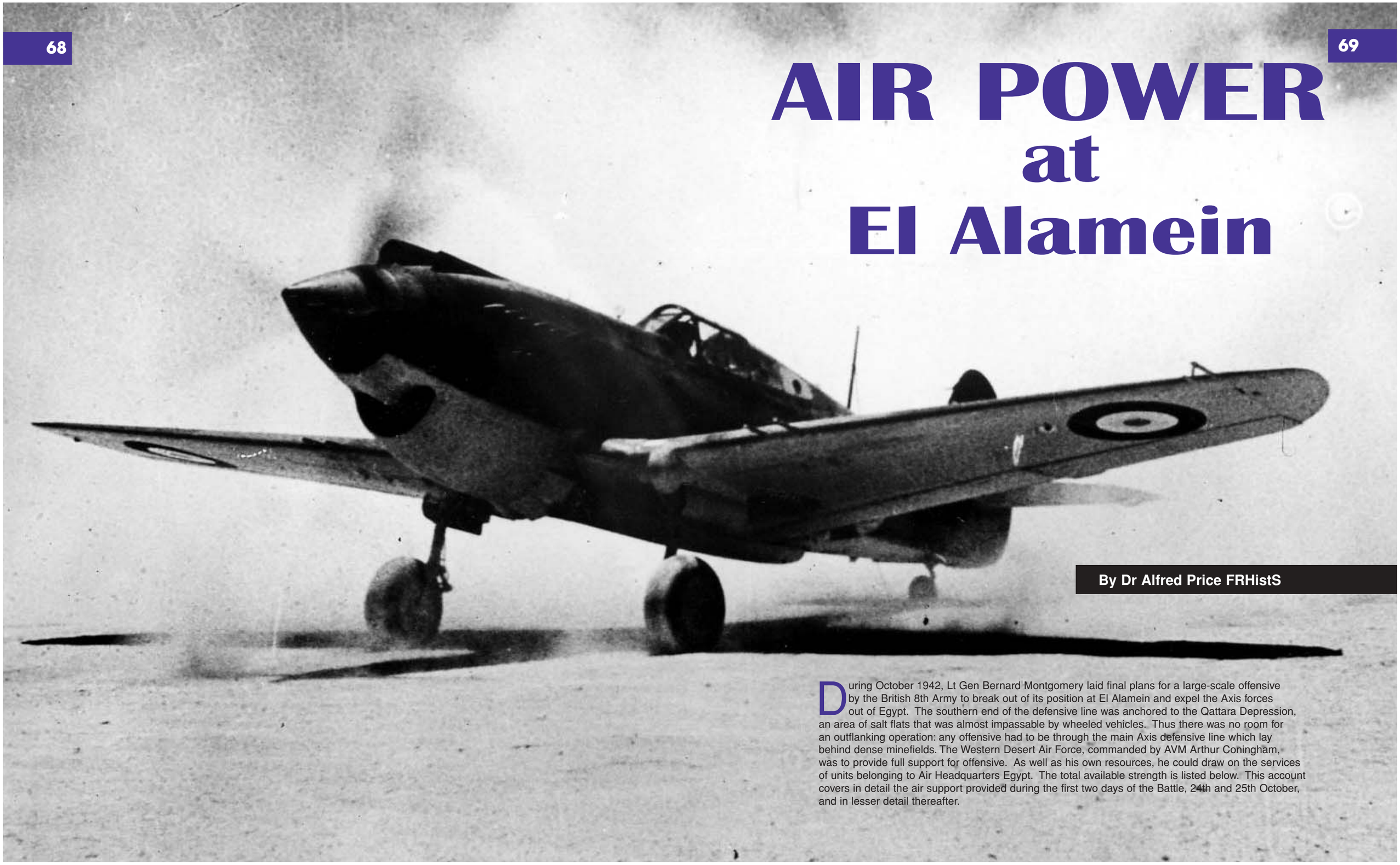
# AIR POWER at El Alamein



By Dr Alfred Price FRHistS

During October 1942, Lt Gen Bernard Montgomery laid final plans for a large-scale offensive by the British 8th Army to break out of its position at El Alamein and expel the Axis forces out of Egypt. The southern end of the defensive line was anchored to the Qattara Depression, an area of salt flats that was almost impassable by wheeled vehicles. Thus there was no room for an outflanking operation: any offensive had to be through the main Axis defensive line which lay behind dense minefields. The Western Desert Air Force, commanded by AVM Arthur Coningham, was to provide full support for offensive. As well as his own resources, he could draw on the services of units belonging to Air Headquarters Egypt. The total available strength is listed below. This account covers in detail the air support provided during the first two days of the Battle, 24th and 25th October, and in lesser detail thereafter.

# AIR ORDER OF BATTLE: THE ATTACKERS

On 19 October, four days before the offensive opened, the combined strength of the Allied Air Forces in the eastern Mediterranean area was 1,080 combat aircraft from the RAF, the Fleet Air Arm, the US Army Air Force and the South African Air Force. These comprised the following[1] :

| | |
|---|---|
| *Single engined fighters, fighter-bombers (Spitfires, Hurricanes, P-40C Tomahawks, P-40D Kittyhawks and P-40F Warhawks)* | *468* |
| *Anti-tank aircraft (Hurricane IIDs)* | *9* |
| *Twin-engined fighters (Beaufighters)* | *29* |
| *Night fighters (Beaufighters, Hurricanes)* | *62* |
| *Light bombers (Bostons, Baltimores)* | *114* |
| *Medium bombers, day (Mitchells)* | *37* |
| *Medium bombers, night (Wellingtons)* | *82* |
| *Heavy bombers, day (Liberators)* | *42* |
| *Heavy bombers, night (Halifaxes)* | *19* |
| *Torpedo bombers, (Wellingtons, Beauforts)* | *71* |
| *Army Co-operation and Reconnaissance (Spitfires, Hurricanes, Baltimores)* | *79* |
| *Light attack aircraft (Fleet Air Arm Albacores, used to drop flares at night)* | *32* |
| *Coastal, miscellaneous (Sunderland, Catalina, etc)* | *36* |

*According to one source[3] 920 aircraft were combat ready when the offensive opened*

During the weeks before the offensive units flew reduced numbers of operations to allow them to rest, train, to be brought to full strength and to improve serviceability.[2]

According to one source[3] 920 aircraft were combat ready when the offensive opened. The closest RAF airfields to the front line were at Hamman, about 25 miles back. There were several well-equipped airfields around Alexandria, 50 miles from the front line, and others further back.[4]

The attacking air force possessed several surveillance radars for fighter direction. To assist fighter control during the offensive, the RAF established a forward radar station on Ruweisat Ridge, 10 miles from the front line. This operated an AMES Type 5 (long range early warning and fighter control, range 90 miles), and an AMES Type 6 (short-range mobile surveillance and fighter control radar, range of about 50 miles).[5]

# AIR ORDER OF BATTLE: THE DEFENDERS

By this stage in the campaign the Axis air forces in North Africa were stretched to the limit. In terms of combat effectiveness their capability was a mere shadow of that available to the Allies.[6] Although the Axis air forces possessed more than seven hundred combat aircraft in North Africa,[7] only a small proportion of those could be supported at bases within effective operating range of the combat zone. Moreover, with fuel in short supply, most of what there was went to the Luftwaffe.

*After the Battle began, the Luftwaffe transferred two Gruppen with about 50 Messerschmitt 109 fighters to the Alamein front...*



Thus the Italian air contribution to the Battle can safely be disregarded. The strength return from Fliegerfuehrer Afrika on 22 October [8] listed just 90 serviceable aircraft:

| | |
|---|---|
| Fighters, fighter reconnaissance (Messerschmitt 109s, 110s): | 40 |
| Dive bombers (Junkers 87s): | 40 |
| Fighter bombers (Messerschmitt 109s): | 10 |

After the Battle began, the Luftwaffe transferred two Gruppen with about 50 Messerschmitt 109 fighters to the Alamein front.[9] Against the overwhelming Allied numerical superiority, however, these made little difference.

*The poor supply situation caused severe shortages, especially in aviation and motor fuel*

The Axis forces in North Africa suffered badly from having long lines of communication that were under continual attack from aircraft and submarines. The poor supply situation caused severe shortages, especially in aviation and motor fuel. Things got so bad that the Germans were forced to resort to using air transport to carry fuel and other priority cargoes. In the case of fuel, the two-way flight from Crete consumed about half as much as the aircraft brought in.[10]

In addition to the above forces, and available to support the ground battle, there were about 80 German medium bombers (Ju 88s) and about 20 reconnaissance planes based on Crete. Also, there were about 250 Junkers 52 transport aircraft continually moving around the area, many of which were used to fly in supplies to North Africa. As the Battle progressed the strength of the medium bomber force on Crete was greatly increased as units moved to the island from Sicily.[11] Also, there were 265 Italian bombers, mainly from anti-shipping units, based on Rhodes.

The nearest Axis airfields to the battle area were at El Daba, about 20 miles back. There were several other airfields along the coast to the west.[12] The airfields in Crete and Rhodes were in each case about 350 miles from the battle area. The defending air force possessed several surveillance radars to assist fighter direction. The nearest station, within 25 miles of the front line, was situated at El Daba and operated a Freya early warning and fighter control radar with a range of 90 miles.

# ANTI-AIRCRAFT ARTILLERY

With far fewer fighters than the Allies, the Axis forces had to place greater reliance on their AAA. The German forces in North Africa possessed

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about seventy dual-purpose (anti-aircraft/anti-tank) 88-mm guns operating in four-gun batteries. In the rear areas, some of these batteries were equipped with Wuerzburg fire control radars. Smaller calibre German AA weapons, 20 mm and 37 mm, were available in larger numbers and these were effective up to about 6,000 feet. The Italian forces employed 75 mm AA guns, without radar control, and a similar range of smaller weapons. British AAA weapons, the 3.7-in gun and the 40 mm Bofors, had few opportunities to engage enemy planes during the Battle.

## RELATIVE EQUIPMENT OF THE OPPOSING AIR FORCES

The German fighter force in North Africa had recently converted from the Messerschmitt 109F to the latest G version. The best Allied fighter types were the RAF's Spitfire V and the USAAF's P-40F Warhawk, but the Me 109G had the edge over both of them.[13] Moreover, the Spitfires and Warhawks equipped only a small part of the Allied fighter force. More than half the Allied fighter strength was made up of obsolescent Hurricanes, with a performance much inferior to that of the Me 109G.[14]

The Allied light, medium and heavy bomber units all operated modern types that were superior in performance and bombing capability to their counterparts in the Axis air forces. The latter were all approaching obsolescence, and at that time the Luftwaffe had no heavy bomber in service. The Junkers 87 "Stuka" dive-bomber could attack with greater precision than any other bomber type taking part in the Battle. Yet, if these vulnerable aircraft were to avoid heavy losses during daylight operations, they required strong fighter protection.

During the Battle that would rarely be possible, and for much of the time the Stukas confined their operations to dawn and dusk — with a consequent reduction in attack accuracy. One recently-formed RAF one squadron operated nine Hurricane IID anti-tank aircraft.

These carried two Vickers S guns, 40 mm cannon mounted in bulges under the wings each with a magazine holding sixteen armour-piercing rounds. The Mark IID also carried two .303-in machine guns loaded with tracer rounds, to assist in aiming the cannon.[15] The 40 mm cannon were semi-automatic weapons, at each press of the firing button both cannon fired a single round. The pilot approached the target flying at 50 feet at 240 mph. He commenced firing at a range of 700 yards, with both the machine guns and the heavy cannon. A trained pilot could fire five aimed pairs of 40-mm rounds during a single firing pass. The Hurricane IID was at its most effective against tanks that had broken through the defences and had outrun their AA protection.



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*The best RAF reconnaissance aircraft was the Spitfire IV, an unarmed version of the famous fighter fitted with cameras and extra internal fuel tanks*

Tanks accompanied by motor vehicles were judged to have AA protection, and were considered too dangerous to attack.[16] The ideal conditions for Hurricane IIDs to go into action were rarely met in North Africa after the summer of 1942. It was, however, reassuring for army commanders to have such aircraft available to counter a breakthrough, even if opportunities to employ them effectively were rare.

Based in Crete, the Luftwaffe had about three Junkers 86P high altitude reconnaissance aircraft able to operate at altitudes around 39,000 feet. These aircraft posed a very difficult interception problem for the Allied fighter types available in the theatre. However, serviceability of the Ju 86P was poor and often none was available for operations. The best RAF reconnaissance aircraft was the Spitfire IV, an unarmed version of the famous fighter fitted with cameras and extra internal fuel tanks; although its altitude performance was inferior to that of the Ju 86P, it was still very good. Moreover the Spitfire IV was considerably faster and more manoeuvrable than the Ju 88P, and its serviceability was far better.

## TYPES OF BOMB USED FOR GROUND ATTACK OPERATIONS

On the Allied side, during the Battle the only types of bomb used in close support operations were general purpose free fall weapons, mainly 250 pounders[17] but with a small proportion of 500 pounders. In some cases these weapons were fitted with nose fuse extensions, spikes to detonate them close to the surface. Air-to- ground rockets and cluster bombs were not available in theatre; retarded bombs lay well in the future.

That limitation meant that Allied fighter-bombers were unable to deliver effective horizontal bombing attacks from low altitude. If the bombs were fused to detonate on impact or very soon after, the releasing aircraft was likely to suffer splinter damage. If the bombs were fused to detonate when the aircraft was well clear, say after a delay of 10 seconds, unless the target was large enough and strong enough to stop them the bombs might tumble hundreds of yards beyond the target before they detonated. Fighter-bombers therefore attacked in a shallow dive, commencing at around 10,000 feet and releasing at 4,000 feet.[18] Usually this method was not accurate enough to destroy small battlefield targets such as vehicles or artillery positions. Alternatively, fighter-bombers often flew as part of the escort for twin-engined bomber formations, each aircraft carrying a single 500-pound bomb[19] which they dropped in the target area.

During the German advance in the previous May, the WDAF had employed its newly-delivered Kittyhawks to deliver low-altitude strafing attacks without top cover. The Kittyhawks claimed the destruction of some 200 enemy vehicles. However, within a four-day period more than forty Kittyhawks were lost to AAA and enemy fighters, exhausting the reserve of these fighters.[20] The experiment was not repeated.

On the Axis side the majority of bombing attacks in the battle area were by Junkers 87 Stukas employing their famous 80-degree steep dive attack, usually releasing one 550-pound bomb and four 110-pound general purpose bombs.

The Luftwaffe inventory included one very effective type of cluster munition, the SD-2 weighing 4.4 pounds. Fighter-bombers dropped containers with 108 of these weapons, during low-level attacks.[21] However, the SD-2s were in short supply and the Eastern Front had priority. It is doubtful whether many were used during this Battle.

## DIRECTION OF GROUND ATTACK OPERATIONS

The front line had been more or less static for about four months, giving aircrews on both sides plenty of time to become thoroughly familiar with the landmarks in the area. By October 1942, the Allied organisation for controlling air strikes in the battle area was efficient by the standards of the day. The Air Support Control Centre was co-located with the Advanced Air Headquarters and the Eighth Army Tactical Headquarters, at Burg el Arab 35 miles from the front line.[22] Tactical reconnaissance Hurricanes made frequent flights over the battle area and reported by radio on enemy movements and possible targets for attack.

Throughout the day, bomber units were held at readiness at forward airstrips, ready to take off at short notice. From the origination of a request for air support, until the bombers arrived over the target, took on average about one hour.[23] That time included the rendezvous with the escorting fighters, and a flight from the airstrip to the target averaging about 20 minutes. Where appropriate, the targets were marked by artillery firing smoke shells.[24]

The Luftwaffe used forward air control officers (Fliegerleitoffiziere) to guide attacking aircraft on to ground target. These men operated from armoured cars equipped with radios for ground-to-air communications, close to the front line.[25]

During the week following the opening of the Battle, the attacking troops moved forwards only slowly and aircrews had no difficulty in distinguishing between friendly and hostile positions.



Curtiss Kittyhawks of the Desert Air Force.

*...a force of 35 Kittyhawk fighter-bombers, with an escort of Spitfires and Kittyhawks, attacked the Axis anding grounds at Daba*

## INTELLIGENCE AVAILABLE TO THE ALLIED FORCES

The Allies' Ultra cipher-breaking operation, coupled with other types of signals intelligence, provided a wealth of information on Axis movements and intentions. Particularly valuable was intelligence on Axis supply convoys, which included routing and timing information so they could pick up their air cover as they neared the coast of North Africa. Consequently, the convoys suffered heavy losses from Allied aircraft and submarines.[26]

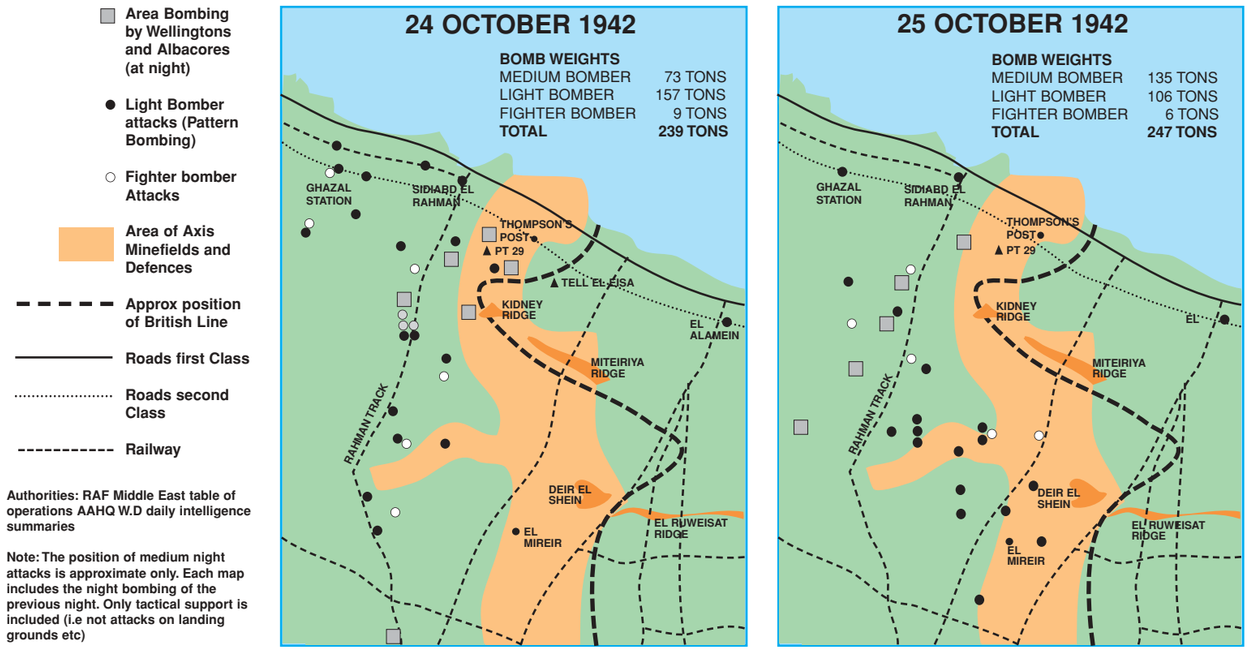
As part of the preparation for the battle, Allied reconnaissance aircraft systematically photographed the entire battle area. Their prints were combined to produce a mosaic picture showing the location of enemy minefields, wire defences, gun-pits etc.[27] Frequent flights over the defenders' rear areas by tactical reconnaissance aircraft ensured that any moderate sized troop movement by day was unlikely to avoid being seen and reported.

## INTELLIGENCE AVAILABLE TO AXIS FORCES

From the degree of Allied activity, it was clear to Axis commanders that a major offensive was in the offing. However, due to the high degree of air superiority established by the Allied air forces, Axis reconnaissance planes had great difficulty photographing the area. It appears that no Ju 86P was serviceable for some days before the British attack. The Axis air forces were unable to observe British army positions between 18 and 23 October, when British forces were assembling for the attack.[28] As a result the time and the place of the main thrusts were not determined, and the attackers retained the all-important element of tactical surprise.

## AIR ACTIONS PREPARATORY TO THE OFFENSIVE

Commencing four days before the offensive opened, Allied bombers carried out a systematic bombardment of Axis airfields in Egypt and eastern Libya. This phase involved 76 sorties by medium bombers, 208 by light bombers and 285 sorties by fighter-bombers.[29] There was also a vigorous programme of reconnaissance missions over Axis front line positions, rear areas and airfields.




Authorities: RAF Middle East table of operations AAHQ W.D daily intelligence summaries

Note: The position of medium night attacks is approximate only. Each map includes the night bombing of the previous night. Only tactical support is included (i.e not attacks on landing grounds etc)

Douglas Bostons of No 12 Squadron, South African Air Force.

*Allied Boston, Baltimore and Mitchell bombers flew some 235 sorties, in the course of eighteen pattern-bombing attacks*

Throughout this period and the Battle that followed the Allied four-engined bombers, single squadrons each of USAAF B-24 Liberators and RAF Halifaxes, attacked distant targets such as the supply ports at Tobruk and Benghazi in Libya, and airfields and other targets on Crete and the Greek mainland[30] Since this account is concerned mainly with operations close to the Battle area, the use of these aircraft will not be considered further.

Soon after dawn on 23 October a force of 35 Kittyhawk fighter-bombers, with an escort of Spitfires and Kittyhawks, attacked the Axis landing grounds at Daba. Similar attacks were mounted throughout the day and fighters mounted standing patrols over the Axis airfields and the 8th Army's troop assembly areas.[31] These were intended to prevent Axis reconnaissance planes locating the assembly areas or, if the latter were located, to prevent air attacks on them.

## COURSE OF THE AIR BATTLE, NIGHT OF 23/24 OCTOBER

Over the Axis rear areas, twelve Fleet Air Arm Albacore light attack planes sought out enemy artillery and troop positions and dropped flares to illuminate these. Sixty-six Wellington bombers also patrolled the area, and bombed any worthwhile target seen. Several fires were started on the ground, and there was a large explosion which rocked an aircraft flying at 6,000 feet. At the same time six Wellingtons orbited near the battle area radiating jamming on German Army tactical radio nets.[32] The noise from so many aero-engines served a useful additional purpose, in helping to mask the sound of British tanks moving up to their start lines.

Following a powerful preparatory bombardment commencing at 2130 hours, Allied ground troops slowly advanced along lanes the sappers had cleared through the dense minefields. The attacking troops broke into the defences at two points, but progress was slow.

In a diversionary operation about 80 miles beyond the front line, four Bostons laid smoke screens off the coast at Maaten Bagush to aid a dummy landing operation by Royal Navy warships. As part of the same operation, four Hudson transport planes dropped dummy paratroops near Fuka. Also, 26 Hurricanes and 4 Beaufighters carried out strafing attacks on targets of opportunity in the German rear areas.[33]

## COURSE OF THE AIR BATTLE, 24 OCTOBER

**Battle Area**

Although there were clear skies for much of the first day, patches of cloud caused some problems. From mid-day, rising dust at some RAF forward landing grounds prevented fighter operations.[34] Allied fighter units flew 230 counter-air patrols, over the battle area and over Axis airfields. They also flew about 200 bomber escort sorties. Throughout the day Allied aircraft encountered Axis fighters on only two occasions. In addition there was a small-scale attack by fighter-bombers on a British ground, position, but no damage was reported.[35]

That morning Hurricane IIDs carried out an anti-tank sweep over the southern part of the line and claimed hits on eight enemy tanks. That afternoon the Hurricane IID units went into action again, and claimed hits on a further ten tanks. German records confirm that seven medium and light tanks were destroyed and five seriously damaged during these actions. No Hurricane IID was lost.[36]

Allied Boston, Baltimore and Mitchell bombers flew some 235 sorties, in the course of eighteen pattern-bombing attacks. Two of these attacks targeted the Axis airfields at Qotafiyah and Fuka, the remainder were close support missions on vehicle concentrations in the battle area. Eight bombers were lost during these attacks.[37]

Typically, pattern-bombing attacks were mounted by formations of eighteen twin-engined bombers flying at altitudes between 7,000 and 10,000 feet. The aircraft flew in close formation, and the bomb-aimer in the leading aircraft aimed his bombs at the near end of the target area. As the leading plane released its bombs, the other bombers in the formation released theirs. The advantage of this method of attack was that all the bombs were aimed by the best-qualified bomb aimer in the unit, an important factor considering the uneven levels on training and experience in wartime units. The width of the bomb pattern equalled the width of the formation, typically 60 to 200 yards depending on the lateral spacing between planes.
The length of the bomb pattern equalled the length of the formation plus the length of bomb stick selected, typically 300 to 500 yards. If such an attack fell accurately across an enemy troop position or vehicle concentration, the effect of more than a hundred closely-spaced 250 and 500-pound bombs detonating within a period of a few seconds caused a considerable shock effect.

Although many of these attacks failed to inflict serious casualties, this ever-present threat forced Axis units near the front line to disperse their vehicles and equipment over a wide area.

When the German dual-purpose 88-mm guns were not taking engaging ground targets, they proved their effectiveness against the Allied bomber formations. The pattern-bombing actions were not one-sided affairs, as these details on the attacks on 24 October make clear:[38]

1140 hours. 6 Bostons and 12 Baltimores attacked enemy vehicles well-dispersed. AA fire accurate and intense, 1 Baltimore damaged. 90 x 250-pound bombs dropped.

1210 hours. 12 Bostons and 6 Baltimores attacked the landing ground at Qotafiya. AA fire intense and accurate.

1442 hours. 4 Bostons and 12 Baltimores attacked enemy vehicles at [map reference] No observed results. AA as above. 1 Boston shot down, 11 bombers damaged.

1545 hours. 16 Bostons, 1 Baltimore attacked enemy vehicles at [map reference]. One direct hit on a vehicle, AA as above. 3 bombers damaged.

During the day Allied fighter-bombers flew some 70 sorties against Axis airfields, and 12 more over the battle area.

Lacking fighter escorts, the Ju 87 dive-bomber units were restricted to operating at dusk, during the night and at dawn.

**Sorties flown, dawn 24th to dawn on 25th October**
RAF and USAAF, about 1130
Luftwaffe, 107[39]

**Aircraft Losses during above period**
RAF and USAAF: 8 bombers (all to AA fire), 5 fighters
Luftwaffe: 2 single engined, 1 twin-engined fighter
Italian Losses not known, but very light

## NIGHT OF 24/25 OCTOBER

Wellingtons flew 85 sorties[40] assisted by flares dropped by Albacores, which repeated the previous night's harassment of enemy troops close to the front line.

About a dozen Junkers 88 bombers flew from their bases in Crete to the forward landing ground at Sidi Haneish, to attack targets in the battle area. One Ju 88 attacked vehicles of the 8th Armoured Brigade formed up to pass through a narrow gap cleared through a minefield. Its bombs set ablaze a petrol lorry, and the resultant glow attracted artillery fire as well further bomber attacks. Eventually there were about 25 lorries ablaze, many of them loaded with fuel or ammunition. The resultant explosions halted the British advance at that part of the front, until the fires burned themselves out some hours later.[41]

## COURSE OF THE AIR BATTLE, 25 OCTOBER

**Battle Area**
The sources make no mention of any problems caused by the weather during the morning, but rising dust caused the cancellation of some attacks during the afternoon. Allied fighters flew 221 sorties on



*Despite their superior equipment, the German fighter units were unable to prevent or hinderAllied bombers, fighter-bombers and reconnaissance aircraft from operating freely over the battle area*

offensive sweeps through the battle area and over enemy airfields, and 226 bomber escort sorties. They claimed seven Axis planes shot down, Luftwaffe records admit the loss of that number.[42]

Boston, Baltimore and Mitchell bombers flew 165 sorties, delivering nine pattern-bombing attacks. Of those, seven were for close air support and the other two were against airfields. All these attacks were escorted by fighters.

Near Tobruk, eight Beaufighters conducting a sweep along the coast encountered a formation of about twenty Junkers 52 transports flying in from Crete, escorted by six Me 110s. During the subsequent mêlée, a Beaufighter collided with a Ju 52, resulting in the loss of both aircraft. Although the Beaufighters claimed the destruction of four Ju 52s, detailed German records list only one such loss.[43]

## NIGHT OF 25/26 OCTOBER

Wellingtons flew 64 sorties against German troop positions, assisted by 14 Albacores which dropped flares. One large explosion and several small fires were reported.[44] German bombers attempted to repeat their success of the previous night, attempting to hit vehicles passing through the narrow gaps through the minefields. Night fighter Hurricanes flew 30 sorties over the area, and had several encounters with enemy planes. The latter had no further success in their attempt to hit ground targets.[45]

**Sorties Flown, dawn 25 Oct to dawn on 26th**
RAF and USAAF, about 705 sorties
Axis Air Forces, about 240 sorties

**Aircraft Lost during Above Period**
RAF and USAAF: 8 bombers (all to AA fire), 5 fighters
Luftwaffe: 4 single engined fighters, 1 bomber, 2 dive-bombers, and 1 transport plane
Italian Losses not known, but very light

## AFTER 25 OCTOBER

Following the first two days, the air operations continued on the now-established pattern. Despite their superior equipment, the German fighter units were unable to prevent or hinder Allied bombers, fighter-bombers and reconnaissance aircraft from operating freely over the battle area.

By concentrating their available force, however, on a few occasions they succeeded in establishing local air superiority over part of the front to enable dive-bombers could attack targets. The latter achieved little, however.

On 26 October, a German and an Italian division counter-attacked the salient established by British troops.[46] For this the Axis units had to concentrate, and that made them attractive targets for pattern-bombing attacks. A series of pattern bombing attacks, combined with artillery fire, broke up the attack.

On 27 October Field Marshal Rommel ordered a further counter-attack. As the 21st Panzer Division was moving into position, it suffered seven successive pattern-bombing attacks during a 2 1/2-hour period. The planned attack did not materialise, neither did a further attempt on the next day. After that, Rommel made no further attempt to seize the initiative.[47]

On 4 November, following a long and stubborn defence by Field Marshal Rommel, the British 8th Army finally broke through the Axis front line in strength. The German and Italian armies were forced to begin a difficult and lengthy retreat that would expel them from Egypt and Libya.

# COMMENTS

The Allied air forces enjoyed the advantages of huge numerical superiority, a much more effective bomber force, far shorter lines of communication and much better-supplied airfields. Consequently, during the first two days of the offensive they flew more than five times as many sorties as the Axis air forces. The Allies possessed a very high degree of air superiority at the start of the battle, and within a couple of days they had established air supremacy.

Prior to the offensive, RAF photographic reconnaissance aircraft had secured blanket coverage of enemy positions along and behind the front line. That greatly assisted in planning the main attack, and established the priority targets for artillery and aerial bombardment.

At the same time, the Allies' air superiority enabled them to stifle attempts by Axis planes to conduct effective air reconnaissance over Allied troop positions before the offensive began. As a result, the attackers retained tactical surprise until the main artillery bombardment began. Throughout most of the Battle, Axis commanders had little hard information on the movements of Allied ground forces until the latter came within sight or sound of their forward positions.

During the Battle Allied light and medium bombers mounted several pattern-bombing attacks. On many occasions these attacks failed to inflict serious damage or casualties, yet the ever-present threat of them forced Axis commanders to disperse their vehicles and equipment over a wide area in the desert. When vehicles needed to concentrate, in preparation for an attack or to deliver a counter-attack, the pattern-bombing attacks proved extremely effective. If one fell across an enemy troop or vehicle concentration, the effect of more than a hundred closely spaced 250 and 500 pound bombs detonating in a few seconds caused a shock effect similar to that now produced by a B-52 operating in the battlefield support role. Discussing the campaign in North Africa, Field Marshal Rommel would later write: "Anyone who has to fight, even with the most modern weapons, against an enemy in complete control of the air fights like a savage against modern European troops, under the same handicaps and with the same chances of success."[48]

Due to the shortage of fuel and poor serviceability, Axis air forces flew low sortie rates during the Battle. Deprived of fighter escorts the German Junkers 87 dive-bombers were able to operate only between the hours of dusk and dawn. They achieved little.

Throughout the Battle the potentially powerful force of Ju 88s units based on Crete was not used effectively. They flew a few tactical bombing missions in support of the army, and what amounted to nuisance raids on targets in Egypt. They were also employed, some have said misemployed, on flying escorts for convoys of shipping and carrying fuel and other priority items to North Africa.49 Their only noteworthy success during the Battle was on the night of 24/25 October, when they hit petrol and ammunition lorries and caused fires which halted the 8th Armoured Brigade's passage through a minefield for several hours.



Notes:

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