

1939-1945

Mapping the Second World War

MILITARY CARTOGRAPHY

Peter Chasseaud, a leading authority on military cartography and the author of a major new book on the subject, tells the story of WWII through maps.

The Second World War was a composite of two major wars – one instigated by Hitler’s Germany, the other by Hirohito’s Japan, with yet another opportunistically conjoined by Mussolini’s Italy – and it sprawled across the globe to an even greater extent than the First World War.

The mind-numbing statistics of modern war are familiar territory, but it is worth remembering that the map’s ‘paper landscape’ does not always ‘speak with a grimly voice’ about the horrifying experiences of war.

The Second World War was a ‘total war’, foreshadowed as such by the First World War, with its mobilisation of whole populations, and its use of submarine and naval blockade to starve civilian populations.

Technologies were used that had been born before or during the First World War: aircraft, aerial photography and photogrammetry (precise plotting from aerial photographs), wireless (radio), poison gas (used in the Second World War not against soldiers, but by the Nazis in their genocide programmes against civilians), submarines, sonar (ASDIC), sound-ranging (artillery), signals intelligence (SIGINT),

carrier-based aircraft, and strategic bombing – to name but a few.

New technologies continued to be developed before and during the Second World War, including radar, rocketry, jet planes, the A-bomb, and wireless- and radar-based navigation systems.

New forms of war emerged: blitzkrieg, with its fast panzer columns and annihilating dive-bomber attacks; area (‘carpet’) bombing (notably of Germany and Japan); and ‘deep battle’, again foreshadowed in the First World War, became the norm.

The fundamental ‘principles of war’ did not change – speed, surprise, concentration at the decisive point, seizing the initiative, unity of command, mutual support of all arms, simplicity, economy of force, security (and an exit strategy!), and others.

Being stronger was useful: it was always a good idea, as the Confederate General Nathan Bedford Forrest pointed out, to ‘git thar fustest with the mostest men’. It was also a good idea to have a capable commander with an efficient staff and sound plan, to be agile and have rapid reactions, to be well-armed, to have good command, intelligence and communications, to be well-supplied with food, water, munitions, and

maps, to know what you were fighting for, and to have high morale.

MAPPING THE LITTLE-KNOWN

Most of the operations of the Second World War were conventional in nature, and often resembled those of the previous war. In all types of warfare, whether on land, at sea, or in the air, including unconventional operations and combined operations, maps and charts were absolutely vital, especially when the action moved beyond immediate and well-known ground.

Among the enduring images of WWII are photographs and paintings of the war’s nerve-centres, emphasising the centrality of the map, chart, or ‘plot’ – in London, the Central or Cabinet War Rooms, the Admiralty’s Operational Intelligence Centre and Submarine Tracking Room under the Citadel next to the Mall, the map rooms at the War Office and Air Ministry, those at Bomber, Coastal, and Fighter Command, at Civil Defence Headquarters, at the Western Approaches headquarters at Liverpool, at the D-Day headquarters at Southwick House near Portsmouth, and so on.

These scenes were replicated in Germany, Japan, the Soviet Union, the United States,

and indeed in all belligerent (and many warily neutral) countries. What they all had in common was the representation of the spatial dimension of the war – its strategic geography, extending beneath the sea and far into the air.

READING MAPS

The map, which is a two-dimensional representation, model, or picture of part of the three-dimensional Earth's surface, provided commanders and their staffs at home and at the front with an easy-to-reproduce information system that modelled, in two dimensions (and, in the case of terrain models, in three), the complexities of natural ground-forms and human-created environments of the theatres and battlefields where their forces were operating.

The best commanders could read the map as easily as a book, and carried it inside their heads. The wiser commanders were aware of the map's fallibilities, and made sure that they supported it when possible with other information, such as intelligence reports and reconnaissance and aerial photographs. They also knew how to move across the terrain in the absence of a map – navigating by the sun, the stars, and other natural indicators.

The worst commanders could not read a map or give (or find) a grid reference, and they were a menace not only to themselves, but, tragically, to their men. The Red Army suffered much from such cases, as a Soviet wartime report made clear, but they occurred in other armies as well.

Using maps, commanders determined their strategy, planned and executed their operations, and instructed their subordinates. At the front, the leaders of the smallest tactical units, down to platoons, sections, or squads, orientated their maps, pored over grid references, interpreted the signs or symbols for terrain and tactical features, and gave their orders.

To simplify, they might draw the key features of the map, and dispositions of their own and enemy forces, in the sand, mud, or snow. On the map, the gunners marked their battery or troop positions, and those of their targets. On the large-scale artillery maps, the firing data were read-off. On 'going' maps and smaller-scale topographical maps, tank commanders plotted their routes. On nautical and aeronautical charts, navigators did the same, while bomber pilots and their navigators studied flak and target maps.

THE WORLD MAPPED

By the Second World War, the mapping of most of Europe and many parts of the rest of the world – particularly those which were, or had been, parts of the empires of European powers – had benefited from decades, and even centuries, of increasingly refined mapping.



Image: Alamy

In the run-up to the First World War, the general staffs of the European powers had prepared for war by obtaining and reproducing sheets of the national maps of enemy countries, and also those of neutral powers and potential allies into whose territories hostilities might extend.

Good-quality maps were essential for precise targeting in what became an artillery war. The existing cartographic picture of the 'conflict landscape' was further refined by careful plotting from aerial photographs, and augmented by data pinpointing enemy battery positions obtained by scientific sound-ranging and cross-observation (flash-spotting).

The gridded large-scale map (1:10,000 to 1:25,000 scales) became a crucial part of an integrated weapons system, particularly in the 'siege' or 'position' warfare periods – representing a quantum-leap in military affairs. Medium- and small-scale maps, on the other hand, remained essential for more mobile operations.

The need for hybrid 'chart-maps' for combined operations was underlined by events in the Gallipoli campaign of 1915, when the British (and French) army and navy found it remarkably difficult to compile military topographical mapping and naval hydrography on the common projection and firing grid essential for accurate naval bombardment of shore targets.

However, the resultant 1:40,000 scale sheets, while suffering from a lack of sound basic data, represented a significant advance in combined-operations cartography. Similar problems were encountered, and successfully overcome, in the Sicily ('Husky') landings of 1943 and the Normandy ('Neptune'/'Overlord') operations in 1944.

ABOVE A large wall-map is used to plan air raids against Germany, 1944.

MORE AND BETTER

In general, the military mapping of the Second World War followed the same pattern as the First, but benefited from more extensive and refined air survey, while the massive increase in wheeled motor transport and tracked vehicles led to a focus on road classification and 'going' information.

Air-navigation charts and 'flak maps' (showing enemy anti-aircraft defences) became vitally important, while a great technological advance in air navigation was provided from 1943 by radar-imaging (H2S) from aircraft, enabling the navigator to view on a screen, even through cloud, the ground »

The best commanders could read a map as easily as a book, and carried it inside their heads.

The worst commanders could not read a map... and they were a menace not only to themselves, but to their men.

below him. A new type of map – electronic – had been created.

Other spatial plots also represented forms of mapping. The Admiralty and the RAF had long used wall- or table-plots, an extension of the chart. In signals intelligence work, traffic-analysis and direction-finding, combined with decrypts and other intelligence sources, revealed the geographical disposition of enemy forces and enabled identification of formations and units.

At Bletchley Park, and particularly in Hut 6 Traffic Analysis ('SIXTA'), large wall-plots of German 'Tunny' (teleprinter) and 'Enigma' traffic were maintained. This order-of-battle intelligence provided crucial indications of the enemy's intentions, with call-signs

and nets tracked and located as they moved within or between theatres. In the convoy war, similar techniques enabled U-boats to be tracked and pinpointed, convoys to be routed around known U-boat packs, and these eventually to be destroyed.

MASS PRODUCTION OF MAPS

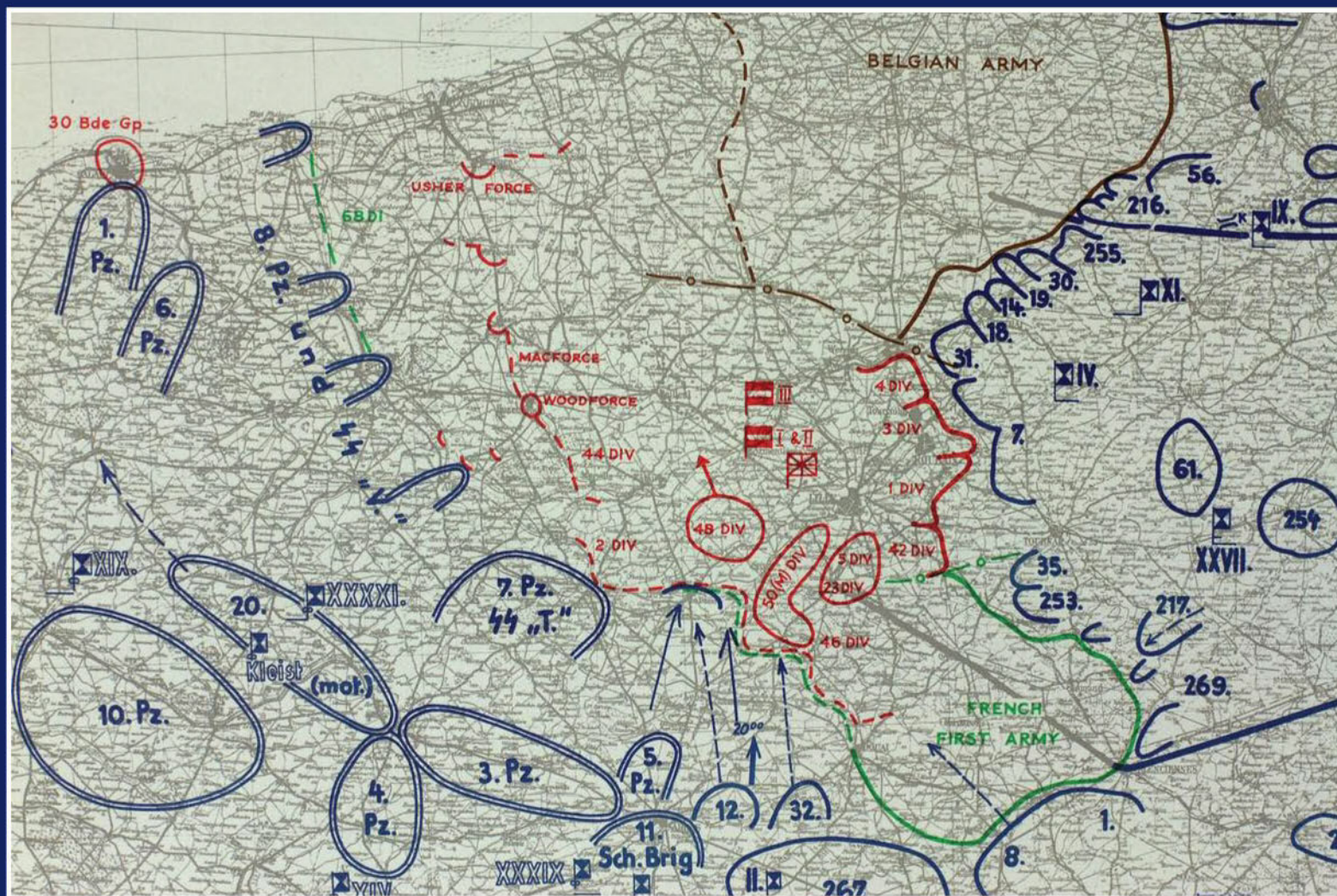
The map-production statistics of the Second World War reveal a stupendous output. Well over 3,000 million map sheets were produced by the Germans, Russians, British, and Americans. Germany printed around 1,300 million sheets – in the German Reich, in printing plants in German-occupied areas, and in numerous field-survey units with formation headquarters in all theatres.

DUNKIRK

*British wartime reproduction of German situation map *Stellungskarte West*. Lage West 24.5.40. German thrusts are in blue, and the Allied positions have been added by the British.* The Germans were at this point pushing the British back on Dunkirk, capturing Boulogne on 25 May and Calais on 26 May 1940. The crisis in France and the Low Countries developed after the Germans crossed the Meuse on 13 May, and smashed through the main French defence on 15 May.

Following the German breakthrough at Sedan and their continued advance, the Germans drove west to the Channel, aiming to divide the British in the north from the French. They reached the old Somme battlefield, south of Arras, on 18 May.

By 20-21 May, German forces were hammering through to Abbeville and the English Channel. They then began to strengthen and widen their 'Panzer corridor', fighting off an Allied counter-attack at Arras on 21 May. 'Operation Dynamo', the evacuation of British and Allied troops from Dunkirk, lasted for ten days at the end of May and beginning of June 1940.



It is estimated that the Soviet Union printed between 600 million and 1,000 million sheets between 1941 and 1945. In the six months from the launch of Operation Barbarossa (the German invasion of the country in June 1941) to December 1941, the Red Army issued 107 million sheets, while in the first six months of 1942, the figure was 55 million, making a total of 162 million for a single year.

The United States saw more than 500 million sheets printed by the Army Map Service during the war, with more printed in theatres of war by engineer units. Ten million sheets were produced for the North African campaign – the Torch landings and Tunisia. Some 70-80 million sheets were printed for D-Day and the Normandy operations, and an equally large number for operations in the Pacific and the Far East.

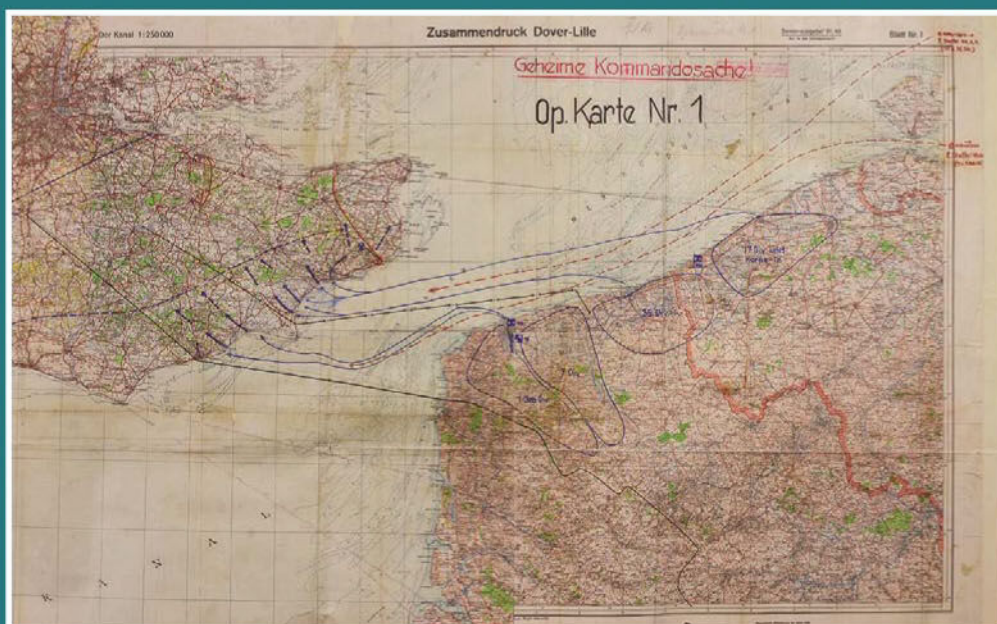
Of the 210 million sheets supplied to US forces during Overlord in 1944-1945, the base facilities under the control of the chief engineers supplied 164 million, of which 80 million came from the Army Map Service, 28 million (after the liberation of Paris) from the French IGN, 18 million from the 660 Engineers Base Topographical Battalion, and 38 million from the British.

Britain produced over 400 million sheets at home, including 60 million by the War Office's Geographical Section of the General Staff (GSGS or MI4), and 343 million by the Ordnance Survey at Southampton. Despite being heavily bombed, the Ordnance Survey produced 194 million sheets, and civilian printing firms under its control another 149 million. In 1943-1945, some 315 million military maps were printed in Britain.

Many millions of maps were also printed by Empire and Commonwealth facilities (for example, by the Surveys of Egypt, India, Ceylon, Australia, and South Africa) and by field-survey units in overseas theatres. In addition, a large number of charts and chart-maps were produced by the Admiralty's Hydrographic Department.

The Second World War was a map war like none other in history. It was, of course, a war of mass production and mass consumption of all kinds of supplies and materiel – but not least of two-dimensional representations of the global battle-space into which so much of the world had been transformed.

Peter Chasseaud is a historian of military cartography, a Fellow of the Royal Geographical Society, and the founder of the Historical Military Mapping Group of the British Cartographical Society. He is the author of Mapping the First World War, and his new book, Mapping the Second World War: the history of the war through maps from 1939 to 1945, was published by Harper Collins in collaboration with the Imperial War Museum in October last year, price £30. »



OPERATION SEALION

German 16th Army map of Operation Sealion, showing MS AOK 6, 9, 16, OKH dispositions for invasion.

Following the evacuation of the BEF from Dunkirk, the Germans intended to defeat the RAF and then invade the United Kingdom. Planning maps were prepared by the German 16th Army (AOK 16) showing concentration areas in France and the Low Countries for the forces detailed for 'Operation Sealion', their routes to and across the English Channel, and their lines of advance in southern England.

The Germans planned for landings on a broad front from Dover to Dorset, and, once these bridgeheads had joined up, for an advance to capture London and the area south of a line from the Bristol Channel to the Wash.

The Germans planned to launch 'Sealion' once they had achieved the air superiority required to neutralise the Royal Navy. In the event, of course, the Luftwaffe was defeated in the Battle of Britain, and the operation never took place.

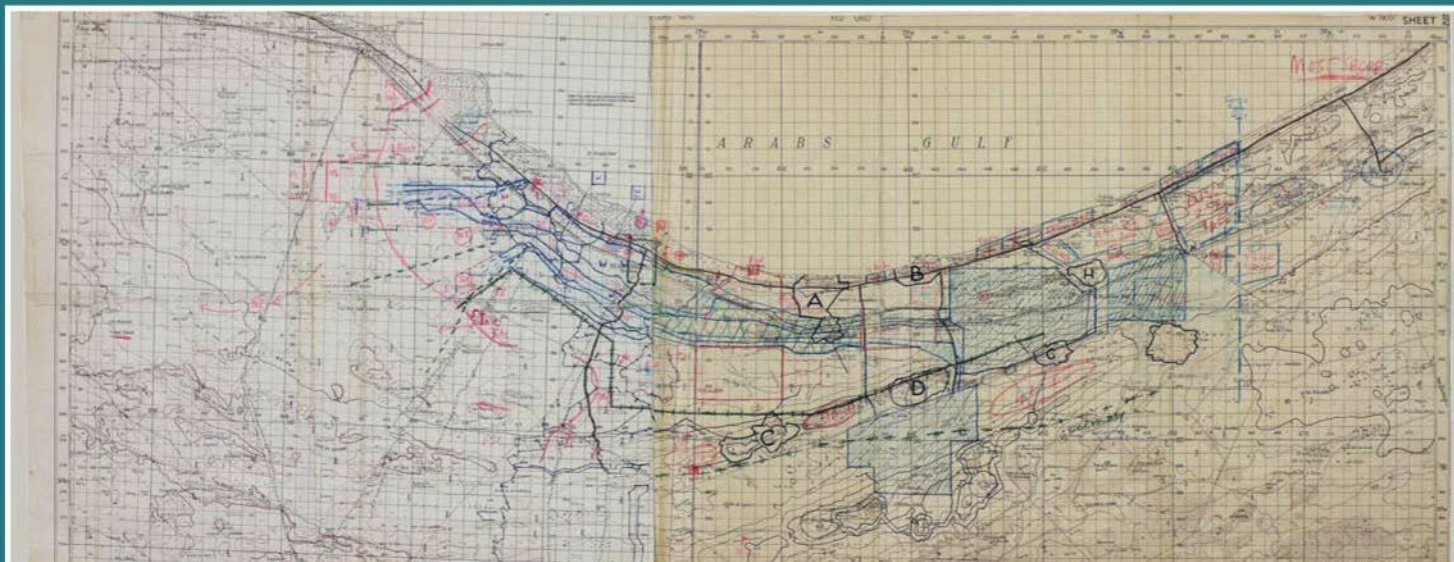


THE BLITZ

German Luftwaffe bombing target map Hafenzielkarte 5.6.41. 'Seeschlange' (Sea Serpent), showing the London docks, with areas of destruction in green.

The London Blitz, which began during the Battle of Britain, was intense from 24 August to 27 September 1940, and continued into 1941. London's docks and the East End suffered very badly.

The code-name 'Sea Serpent' was probably derived from the sinuous shape of the River Thames as seen from the air, and as shown in plan on maps. With the German attack on Russia imminent, air attacks on Britain were diminishing at the time this map was produced, with Luftwaffe formations being transferred eastwards.

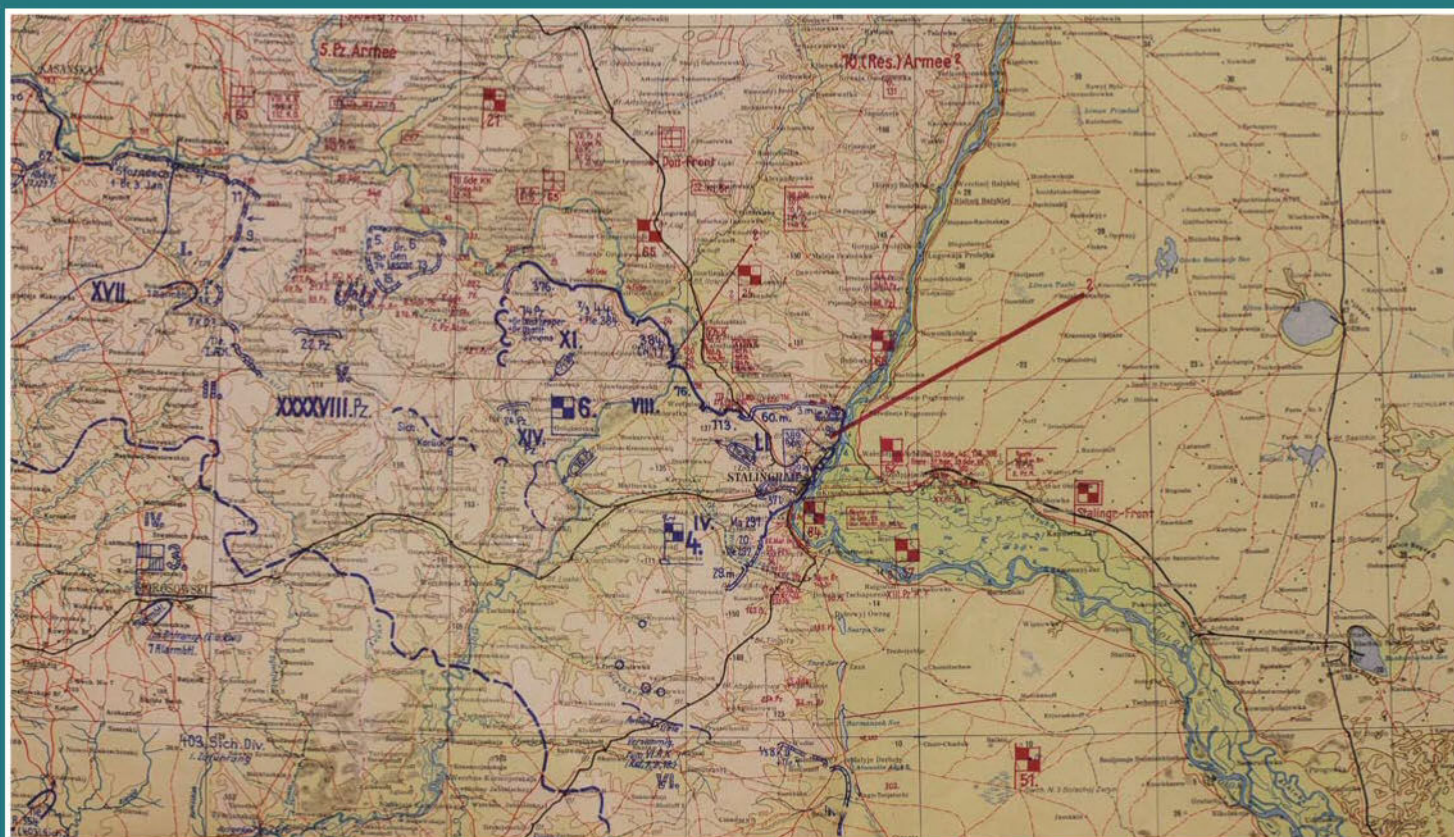


ALAMEIN

British 'Most Secret' planning map of the El Alamein area in the Western Desert, October 1942, showing the Axis (Italian and German) defensive positions, British defences and logistical organisation, British forces poised to attack at Alamein, their objectives, and the development of the attack.

The British stopped Rommel's drive for Egypt in the summer of 1942 at Ruweisat, near Alamein, and Montgomery launched his great counter-offensive at Alamein on 23/24 October.

This planning map provides a wealth of information. Crucial features of the operation, which involved several distinct phases, were the provision of clearly marked tracks (Sun, Moon, Star, etc) to bring the assault troops up to their start lines, and the clearing of lanes through minefields for troops to advance along to engage the main Axis forces.



STALINGRAD

German situation map LAGE OST 21-11-42, showing the Stalingrad area. Axis forces (Army Group B: 6th Army and 4th Panzer Army) are shown in blue, Soviet forces in red.

Following the rapid advance to the Caucasus and Volga by German forces in the summer and autumn of 1942, the Red Army launched Operation Uranus in mid-November 1942, a pincer attack to cut off Paulus's 6th Army, which was heavily engaged at Stalingrad on the Volga.

The operation was intended to 'crumble' the weaker Romanian and Bulgarian divisions holding the shoulders of the Stalingrad salient, and this situation map shows the success of this Soviet operation in the sectors to the north-west and south of the city.

The German defeat at Stalingrad forced a withdrawal to west of Kharkov, and an evacuation of the Caucasus. On 24 December, the Soviets attacked the German 4th Panzer Army, and in January-February 1943 the Russian offensive continued. Kharkov was captured in mid-February. The Germans recaptured Kharkov and Belgorod in March, leaving the Russians holding the huge Kursk salient.

KURSK

Map of the Russian Battlefront, August 1943, published in the United Kingdom by the Serial Map Service, showing the German July 1943 Kursk Offensive, and the Soviet counter-offensives and subsequent advance.

The main map shows the German offensive, which began on 5 July, in blue, and the Russian counter-offensives shown in the insets (Soviet forces in red).

The German failure at Kursk was, after Stalingrad, the turning point of their campaign on the Eastern Front. It was followed by smashing Soviet counter-strokes at Orel to the north and Kharkov to the south. The Germans were now poised to begin their long retreat to Berlin. »

