Logistics and the Desert Fox

by Major Jay Hatton, USMC

The tactical brilliance of the theater commander, the fabled Rommel, could not overcome the logistics problems that confronted German forces in North Africa.

Field Marshal Erwin Rommel, the German theater commander in North Africa during World War II, achieved legendary status as the "Desert Fox" for his combat successes. However, logistics factors strongly influenced his actions, particularly during that critical period from his first offensive in March 1941 to his last-gasp offensive and high-water mark at Alam El Halfa in Egypt 18 months later. Even the most abbreviated analysis reveals the decisive role that logistics played in the outcome of this campaign. In fact, few campaigns in history illustrate so vividly the wisdom of the argument stated in Marine Corps doctrine, that "logistics establishes limits on what is operationally possible." However, the specific factors that contributed to the failure of German operational logistics in North Africa need closer scrutiny.

North Africa Campaign
December 1940-February 1941: British offensive; Italians reeling.
12 February 1941: Rommel arrives in theater.
14 February 1941: Leading elements of Afrika Korps land at Tripoli.
24 March-19 April 1941: First German offensive to recapture Cyrenaica.
May-June 1941: Front stabilized; British launch Battleaxe counteroffensive.
July-November 1941: Siege of Tobruk; German preparations for offensives.
18 November 1941-6 January 1942: British conduct Crusader counteroffensive; siege of Tobruk raised.
7 December 1941: Line stabilized at El Agheila.
21 January-12 June 1942: Rommel's second offensive; Gazala battles.
21 June 1942: Tobruk falls to Germans.
June-July 1942: Rommel's pursuit to El Alamein.
30 August-1 September 1942: Final German offensive at Alam El Halfa.
23 October-5 November 1942: British counter-attack at El Alamein.

8 November 1942: U.S. Operation Torch landings.

18 January-22 February 1943: German counter-attacks in northwest Tunisia, including Kasserine Pass.

13 May 1943: Last remaining elements of Afrika Korps surrender.

The role of Malta—the British-held island in the middle of the Mediterranean Sea—in disrupting Axis lines of communication and thus defeating German designs in North Africa traditionally has been exaggerated. Instead, two logistics factors played a greater role in the ultimate demise of the vaunted Deutsches Afrika Korps. The first of these was the significant disconnect between German national strategic objectives in the theater and the goals of Rommel, the operational commander. This disconnect created an imbalance between operational ends and logistics means that dogged Rommel's efforts, from his spectacular beginning to his inglorious end. The second decisive logistics factor was the failure of Axis intratheater distribution systems. Careful analysis reveals that this intratheater chokepoint, rather than the intertheater constraints imposed by British control of Malta, was the true Achilles' heel of the Afrika Korps.

Context: Time, Place, Circumstance

An understanding of the historical context, including the factors of time, place, and circumstance (the strategic setting), is essential if the lessons of a campaign are to be applied today. The time under study is roughly the period from March 1941, when Rommel launched his first offensive into Cyrenaica (a region of northeast Libya), through August and September 1942, when he led the last major German offensive of the campaign to Alam El Halfa in Egypt. Other key events during the campaign included the first British counteroffensive, Battleaxe, in May and June 1941; the German siege of Tobruk in Libya from July to November 1941; the second British counteroffensive, Crusader, which raised the siege of Tobruk; Rommel's second offensive from January to June 1942, which captured Tobruk; and the subsequent Afrika Korps offensive through Cyrenaica to its culmination at the battle of El Alamein in Egypt. (See the chart at left for a brief chronology).

The North Africa theater and Southern Europe.

The area of operations in the North African campaign in Libya and Egypt and its relationship to Southern and Southeastern Europe is shown in the map above. Contrary to popular perceptions, the portion of the area of operations suitable for high-speed maneuver was somewhat limited. This maneuver area

consisted of a strip of land, ranging from 12 to 38 miles wide, bounded on the north by the Mediterranean Sea and on the south by the desert interior. Sandstorms, endemic insects, poisonous reptiles, and flash floods combined to diminish the effectiveness and endurance of men and machines alike.

A retrospective "logistics preparation of the battlefield" reveals several other important local factors. First, the nature of the region—underdeveloped at best, inhospitable at worst—meant that, for all practical purposes, everything the Afrika Korps needed to conduct operations (fuel, water, ammunition, repair parts, and the like) had to be moved into the theater over sea and air lines of communication from Italy to North Africa and then forwarded to the fighting units at the front. In modern terms, Rommel's quartermasters could rely on very little host nation support. In *Supplying War: Logistics From Wallenstein to Patton*, the noted historian Martin Van Creveld comments on this predicament, "Operating in the desert, neither the British nor their German opponents had the slightest hope of finding anything useful but camel dung, and while the former did at least possess a base of some considerable size in Egypt, the latter were entirely dependent on sea-transport even for their most elementary requirements."

Dependence on sea lines of communication, in turn, required adequate port facilities to receive materiel, as well as ground lines of communication (road or rail) to distribute it from the ports to the fighting forces. Tripoli was the main Axis supply port for forces operating in North Africa. With a capacity of 1,500 tons per day, Tripoli was capable, according to Van Creveld, of handling "under ideal conditions . . . five cargo ships or four troop transports simultaneously." The other significant ports in the area of operations, Benghazi and Tobruk, had nominal throughput rates of 2,700 and 1,500 tons per day, but administrative difficulties and attacks by the Royal Air Force (RAF) limited their actual capacity to 750 and 600 tons per day, respectively.

Once disembarked, supplies had to be moved vast distances over an extremely limited road and rail network to reach the forward depots. Van Creveld notes that "the enormous distances . . . were all out of proportion to anything the *Wehrmacht* [the German Army] had been asked to deal with in Europe. From Brest-Litovsk, on the German-Soviet demarcation line in Poland, to Moscow it was only some 600 miles. This was approximately equal to the distance from Tripoli to Benghazi, but only half that from Tripoli to Alexandria [Egypt]."

Compounding the problem was the lack of adequate roads. There was only one "main supply route," the Via Balbia, which stretched endlessly along the coast, often was interrupted by floods, and was laughably susceptible to both air and ground interdiction. Apart from this, there were only desert tracks, the use of which greatly increased wear and tear on vehicles.

If anything, the rail network was even sparser than the road network. German Major General Alfred Toppe laconically concluded, "There was no continuous railroad in Libya. The two railroads, each about thirty kilometers in length, in Tripolitania [northwest Libya] and in the Cyrenaica, were of no military importance." These local factors had a critical impact on German logistics efforts.

As for circumstance, or strategic setting, the period in question spans the time when Nazi Germany reached the limits of its territorial expansion. Once its forces were unceremoniously evicted from the European continent, Great Britain's role was reduced to minor operations on the periphery of Axis-controlled Western Europe. In June 1941, Hitler began pursuing his dream of conquering the Soviet Union. His summer offensives of 1941 and 1942 brought the Soviets into the war and to the brink of the

abyss. The strategic focus of Germany lay in the east, and most of her available blood and treasure was being expended in the effort to conquer the *Lebensraum* ("living space") that lay beyond the Volga River. Subsequent setbacks at El Alamein and at Stalingrad in Russia, coupled with the active entry of the United States into the European war with Operation Torch in North Africa in late 1942, marked, as Winston Churchill said, "the end of the beginning" of the effort to defeat the Third Reich.

The African Sideshow

As stated above, one factor responsible for the failure of German operational logistics in North Africa was the substantial disconnect between German strategic objectives in the theater and those held by Rommel, the operational commander on the scene. Hitler's principal strategic objective for the North African theater was to bolster the waning political and military fortunes of his Italian ally by helping her sustain a viable presence in North Africa. Hitler sought to maintain North Africa as an economy-of-force theater while massing the Wehrmacht for the decisive campaign in the east against the Soviet Union. So the situation in North Africa called for an essentially defensive approach.

Germany's strategic objectives were to protect her southern flank, keep Italy in the war, and shield the Romanian oil fields in Southeast Europe that were vital to her war effort. Hitler was worried that if Italy lost Tripoli, the last outpost of her African Empire, she would be knocked out of the war. As a result, in the view of historian Jack Greene—

> Hitler decided to send a *Sperrverband*, or `blocking formation.' So the war in Africa would remain Italy's war but now Germany was there to supply just enough troops and equipment to block the [British] Commonwealth advance in Africa while the war would be decided, in Hitler's view, on the steppes of Russia.

Hitler's operational order, issued on 11 January 1941 as Directive No. 22, reflected this defensive mindset: "The situation in the Mediterranean makes it necessary to provide German assistance, on strategic, political, and psychological grounds. Tripolitania *must be held*" [emphasis added].

Rommel held a somewhat different view. Rather than seeing the North African campaign as a strategic sideshow, he viewed it as a means of striking at the heart of the British Empire and into the soft underbelly of the Soviet Union beyond. He later wrote—

> With the entire Mediterranean coastline in our hands, supplies could have been shipped to North Africa unmolested. It would then have been possible to thrust forward into Persia and Irak [sic] in order to cut off the Russians from Basra, take possession of the oilfields and create a base for an attack on southern Russia . . . Our final strategic objective would have been an attack on the southern Caucasian front aimed at the capture of Baku and its oilfields. This would have struck the Russians in a vital spot. A great part of their armor, which was carrying the main burden of the fighting on their side, would have been out of action for lack of petrol. Their air force would have been crippled. They could no longer have expected any further effective American help. Thus the strategic conditions would have been created for us to close in from all sides and shatter the Russian colossus.

A German tank is mired in a desert flash flood.

To accomplish these objectives, Rommel set out to twist Axis strategy to his way of thinking by creating what one author calls the "strategy of self-help," under which he justified additional reinforcements and supplies by achieving spectacular battlefield successes. His position as one of Hitler's favorite generals, as well as the publicity his victories received in the German press, greatly aided him in this effort.

The strategic disconnect had a profound logistics impact for the Afrika Korps and for Germany as a whole. For Rommel, it meant an imbalance between debilitating operational ends and logistics means: the logistics support needed to achieve the objectives he envisioned was not forthcoming from a political regime that viewed his theater as peripheral to the overall war effort. For Germany, the unexpected logistics requirements generated by Rommel's offensive operations resulted in a diversion of critical men and materiel from the Russian front—a circumstance that neither the Wehrmacht nor the *Luftwaffe* [the German Air Force] could afford.

The German historian Wolf Heckmann contends—

> The southern theaters of war eventually demanded a substantial effort at the expense of the Ostland [Eastern] adventure and may have decided the outcome of the war. At the very least, it dramatically influenced its course . . . The code name for the commitment of German troops in Africa was Sunflower. Unconsciously, someone had hit upon the perfect symbol: a huge and showy flower at the end of a long and rather fragile stem.

Cherries on a Cake

While the critical role of Malta as a base for British interdiction of the Axis strategic lines of communication is undeniable, the limited intratheater distribution system was the more important problem facing the Afrika Korps. The most significant weaknesses in this system were the limited capacity of the available ports and the inadequate capabilities of German and Italian overland

transportation assets. These two factors alone contributed more to Rommel's final defeat at Alam El Halfa than did all other factors combined, including enemy action for much of the campaign. Van Creveld states—

> Despite everything, the Italians succeeded in putting an average of 72,000 tons—or just above Rommel's current consumption—across the Mediterranean in each one of the four months from July to October [1941]. Rommel's difficulties, therefore, stemmed less from a dearth of supplies from Europe than from the impossible length of his line of communications inside Africa.

Particularly crippling for the Afrika Korps was the severe shortage of trucks needed to move supplies over the vast distances of the area of operations. In his work, *Panzer Battles*, German Major General F. W. von Mellenthin pointed to this problem—

> Even when our supplies did reach Africa, it was no easy matter to move them to the front, because of the great distances involved. It was 700 miles from Tripoli to Benghazi, 300 from Benghazi to Tobruk, yet another 350 from Tobruk to Alamein. *When we were at Alamein, many of our supplies had to be hauled 1,400 miles from Tripoli* [emphasis added].

In a classic "tooth-to-tail" dilemma, Rommel was never able to muster enough trucks to support the combat formations he had in the theater, much less the additional reinforcements he believed were necessary to decisively defeat the British 8th Army. As Van Creveld notes—

> A motorized force of one division . . . required 350 tons of supplies a day, including water. To transport this quantity over 300 miles of desert, the Army High Command calculated that, apart from the troops' organic vehicles and excluding any reserves, thirty-nine columns each consisting of thirty two-ton trucks would be needed.

Considering the size of the forces in the theater and the unavailability, on average, of 35 percent of his vehicles because of mechanical problems, Rommel would have needed over 5,000 trucks dedicated to supplying his three divisions over a 300-mile line of communication. This figure does not include the vehicles required to support the Luftwaffe. British historian D. Braddock adds, "Fuel, water, and ammunition were sources of constant anxiety to the German commander but his greatest problem was the lack of serviceable transport vehicles without which no army could survive for long in the desert." In typical British style, Braddock understates Rommel's feelings on the subject. To say that Rommel was anxious makes him sound only mildly concerned about this problem; to the contrary, at one point during the campaign the Desert Fox requested an additional 8,000 trucks for his supply columns. Small wonder that Field Marshal Friedrich von Paulus listed "vehicles to carry the supplies" as the number two priority for shipment to the theater, second only to "supplies of all types" and ahead of combat units.

Rommel discovered, to his chagrin, that he was consuming a large portion of his precious fuel stocks simply by transporting the remainder to his forces at the front. This, coupled with losses to enemy action, meant that the Germans were losing as much as 50 percent of all fuel landed in North Africa between Tripoli and the front.

Equally disruptive of Rommel's long intratheater lines of communication was their vulnerability to interdiction by British air and ground units. The fluid nature of operations, coupled with the exposed and

vulnerable desert flank, made ground interception of supply convoys along the Via Bardia or one of the lesser tracks by British armored car columns a real problem for the Axis. More significant was the aerial threat posed by the RAF. In the flat, relatively treeless North African desert, vehicular columns (and the clouds of dust they inevitably generated) often were visible from a distance of 50 miles or more on clear days. This led one member of the Afrika Korps to lament that his vehicles traveling on the desert floor were like "cherries on a cake" to the RAF pilots flying overhead.

Damn the Logistics, Full Speed Ahead!

Rommel's campaign in North Africa from March 1941 to September 1942 provides an excellent example of the decisive impact that logistics factors can have in limiting what is operationally possible. During this campaign, German tactical prowess, particularly in combined arms, was consistently superior to that of their British adversaries. Time and again, Rommel sought to exploit this advantage. His ultra-aggressive approach was driven by his realization that a campaign based on attrition could have only one outcome: German defeat caused by Allied materiel superiority. Consequently, Germany had to exploit any tactical success with extreme vigor—a "Damn the logistics, full speed ahead" approach to desert warfare.

After the campaign, an unrepentant Rommel continued to voice his disdain for the repeated warnings of his logisticians—

> The reason for giving up the pursuit is almost always the quartermaster's growing difficulty in spanning the lengthened supply routes with his available transport. As the commander usually pays great attention to his quartermaster and allows the latter's estimate of the supply possibilities to determine his strategic plan, it has become the habit for the quartermaster staffs to complain at every difficulty, instead of getting on with the job and using their powers of improvisation, which indeed are frequently nil.

Rommel's failure to balance his operational prospects against logistics possibilities exacerbated his already anemic supply situation. Unfortunately for Germany, the quartermasters had the last laugh, albeit out of the other side of their mouths. Rommel recognized too late that his tactical superiority was insufficient in and of itself to gain more than fleeting battlefield successes and vast amounts of useless desert. Van Creveld concludes—

> Given that . . . the capacity of the Libyan ports was so small, the distances to be mastered so vast; it seems clear that, for all Rommel's tactical brilliance, the problem of supplying an Axis force for an advance into the Middle East was insoluble. Under these circumstances, Hitler's original decision to send a force to defend a limited area in North Africa was correct.

In the end, the Afrika Korps' logistics inadequacies prevented it from harvesting strategic fruit from its many tactical accomplishments. The keys to victory in North Africa lay not just with battlefield success but also with logistics acumen—a distinction not lost on the Allied generals who orchestrated final victory in the theater.

For today's logisticians, the relevance of the first logistics factor affecting Rommel—the mismatch between operational ends and logistics means that resulted from the wide gap between Hitler's intentions and Rommel's desires for the North African theater—is largely speculative. Its impact in a future

campaign would depend as much on the environmental and political factors governing that campaign as on military necessities or limitations of strategic lift. Naturally, any U.S. forces engaged in a real shooting war would be furnished all the materiel support they needed. However, the emergence of a second major theater war (MTW) would force both military and political leaders to make hard choices about priorities. Despite the rhetoric, the United States is not manned or equipped to fight and win two "near simultaneous" MTW's. This reality may be recognized during the next Quadrennial Defense Review with a change to a "win-hold-win" approach. For those logisticians unfortunate enough to be in the "hold" theater, the experiences of Afrika Korps quartermasters could become only too familiar.

On the other hand, the problems of intratheater distribution experienced by the Afrika Korps are directly applicable today. The challenges that U.S. logisticians faced during the Persian Gulf War illustrate the enduring validity of this problem. The officer responsible for overall coordination of I Marine Expeditionary Force logistics functions during that campaign, Major General James Brabham, identified intratheater distribution as the "long pole in the tent" of desert warfare.—

> Producing potable water was never a problem in DESERT SHIELD and DESERT STORM . . . moving the water to rapidly maneuvering Marine forces was a problem, however, requiring constant attention . . . Although ample fuel was sourced by the host nation in DESERT SHIELD and DESERT STORM, its movement was a constant issue . . . the third and perhaps toughest of the `big three' is ammunition. [There is] little doubt about its source, the beach or port, but the challenge is storage and line haul.

It is safe to assume that U. S. Army and other Allied logisticians faced even greater line-haul challenges moving water, fuel, and ammunition to support the maneuvers of the XVIII Airborne Corps and VII Corps. In the end, U.S. logisticians relied on host nation vehicles and drivers to line-haul the bulk of their materiel from the air and sea ports of debarkation to the forward resupply points. The availability of thousands of host nation vehicles to support this endeavor was a luxury equaled only by the immensely capable and readily available air and sea throughput facilities in its impact on the Allied sustainment effort. Despite these advantages, the Allied intratheater distribution network was strained to capacity over relatively short lines of communication during a ground war that was shorter than most peacetime combined arms exercises.

Much has been written about the shortcomings in strategic, or intertheater, lift experienced in the Gulf War, and many millions of dollars have been expended to alleviate that problem. While the pace of the buildup for the Gulf War was dangerously slow, much of the blame can be attributed to poor management controls and inadequate use of automated tracking systems and technologies, which led to the movement of much redundant or unnecessary materiel. The conclusions of the oft-quoted Rand Corporation report on the subject, which described how 20,000 of the 40,000 containers transported to the theater were never opened because no one knew what was in them, provides the most striking evidence of the problem.

Meanwhile, the intratheater problem has gotten little attention. In fact, the Army has transferred much of its line-haul capability to the reserve components, and the Marine Corps continues to disavow the mission entirely. While it is unlikely that U.S. logistics trains will be "cherries on a cake" to opposing fliers in the foreseeable future, intratheater lift nonetheless emerges as a significant vulnerability of U.S. ground forces and, consequently, of U.S.-led coalitions and joint task forces. Rather than improving the

situation, the ongoing push in both the Army and the Marine Corps to slash the theater logistics footprint on the ground to a bare minimum will require ground forces to rely even more on an already inadequate theater distribution capability—a conundrum any Afrika Korps quartermaster would have readily understood. **ALOG**

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